Appendix 2 – Ecological Impact Assessment

CSA environmental

Barford Road, Willington, Bedford

Ecological Impact Assessment

Prepared by
CSA Environmental

on behalf of

[redacted]

Report No: CSA/4439/01

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urban design | ecology | landscape | heritage

This report may contain sensitive ecological information. It is the responsibility of the Local Authority to determine if this should be made publicly available.

Report Reference	Date	Revision	Prepared by	Approved by	Comments
CSA/4439/01	08/11/2019	-	LW/TC	JW	Interim EcIA report

CONTENTS

EXECUTIVE SUMMARY

Residential development is proposed at Barford Road, Willington, Bedford for which outline planning permission is sought. CSA Environmental was instructed by Fisher German LLP on behalf of [redacted] to undertake an Ecological Impact Assessment (EcIA) of the proposed development. To inform this assessment, a desktop study, extended Phase 1, and some protected species surveys were undertaken. Additional surveys are proposed for spring/summer 2020.

The Site is dominated by poor semi-improved and amenity grassland of limited ecological interest. Habitats of greater interest are principally found within the western portion of the Site and comprise boundary hedgerows, a small traditional orchard, scattered trees, plantation woodland and scrub. The Site is largely bound by residential properties to the north, south and west with arable land to the east.

Common lizard and grass snake populations are present within the Site. Great crested newt are also known to be present within 500m of the Site. Bat roosting opportunities are limited to a single tree with on-site habitats anticipated to provide moderate foraging and navigational opportunities for local bat populations. Measures to minimise adverse effects on the above have been set out herein, along with precautionary measures in respect to nesting birds and badgers during construction.

Both ecological mitigation and enhancement measures have been set out as part of the proposed scheme. Habitat enhancements will include new boundary planting to the east of the Site, wildflower creation, orchard planting, a new wildlife pond and integrated bird and bat roosting features.

Based on the successful implementation of the measures set out herein, and subject to the findings of further surveys including bats, great crested newt, and reptiles, no significant adverse effects are predicted as a result of the proposed development. Mitigation and enhancement measures could be secured via appropriately worded planning conditions and/or control of detailed designs for the Site.

1.0 INTRODUCTION

1.1 This report has been prepared by CSA Environmental on behalf of [redacted]. It sets out the findings of an Ecological Impact Assessment (EcIA) of proposed development at Barford Road, Willington, Bedford (hereafter 'the Site'). Residential development is proposed at the Site, for which outline planning permission is sought.

1.2 The scope of this assessment has been determined with due consideration for best-practice guidance provided by the Chartered Institute of Ecology and Environmental Management (CIEEM, 2018) and the *Biodiversity: Code of practice for planning and development* published by the British Standards Institute (BS 42020:2013).

1.3 The Site occupies an area of c. 2.0ha and is located around central grid reference TL 11555 49875, to the east of Bedford. It comprises a single field of poor semi-improved grassland within the eastern half of the Site and field of amenity grassland to the west with boundary hedgerows, a small traditional orchard, plantation woodland, scattered trees and restricted areas of tall ruderal and scrub (see Habitats Plan in Appendix A).

1.4 An initial desk study and extended Phase 1 habitat survey were undertaken for the Site in August 2019 as part of a Preliminary Ecological Appraisal, the findings of which are presented herein. In addition, the following further survey work was undertaken in October 2019:

- Badger survey (October 2019)
- Preliminary bat roost assessment (October 2019)
- Habitat Suitability Index (HSI) assessment (October 2019)

1.5 This EcIA aims to:

- Establish baseline ecological conditions at the Site.
- Determine the importance of ecological features which could be affected by the proposed scheme.
- Identify any likely significant impacts or effects of the proposed development on Important Ecological Features, in the absence of mitigation, including cumulative impacts.
- Set out any measures necessary to effectively avoid or mitigate likely significant effects, and identify residual impacts.
- Identify any compensation measures required to offset residual impacts.
- Set out potential ecological enhancement measures that could be delivered by the proposed scheme.

- Confirm how proposed mitigation, compensation and enhancement measures could be secured.
- Provide sufficient information to determine whether the project accords with relevant nature conservation policies and legislation, and where appropriate, to allow conditions or obligations to be proposed by the relevant authority.

1.6 An EcIA can be used for the appraisal of projects of any scale. This is a best practice evaluation process, recommended by CIEEM (2018). It is intended that the evaluation of findings presented here-in will aid the Bedford Borough Council in their review of the planning application.

2.0 LEGISLATION, PLANNING POLICY & STANDING ADVICE

Legislation

2.1 Legislation relating to wildlife and biodiversity of particular relevance to this EcIA includes:

- The Conservation of Habitats and Species Regulations 2017
- The Wildlife and Countryside Act 1981 (as amended)
- The Natural Environment and Rural Communities (NERC) Act 2006
- The Protection of Badgers Act 1992

2.2 This above legislation has been addressed, as appropriate, in the production of this report. Further information on the above legislation is provided in Appendix B.

National Planning Policy

2.3 The National Planning Policy Framework (NPPF) (Ministry of Housing, Communities and Local Government, 2019) sets out the government planning policies for England and how they should be applied. Chapter 15: Conserving and Enhancing the Natural Environment, is of particular relevance to this report as it relates to ecology and biodiversity. Further details are provided in Appendix B.

2.4 The Government Circular 06/2005, which is referred to by the NPPF, provides further guidance in respect of statutory obligations for biodiversity and geological conservation and their impact within the planning system.

Local Planning Policy

2.5 A number of local planning policies relate to ecology, biodiversity and/or nature conservation. These are summarised in Table B.1 of Appendix B. These policies have been addressed, as appropriate, in the production of this report.

Standing Advice

2.6 Natural England Standing Advice regarding protected species aims to support local authorities and forms a material consideration in determining applications in the same way as any individual response received from Natural England following consultation. Standing advice has therefore been given due consideration, alongside other detailed guidance documents, in the scoping of ecological surveys and production of this report.

3.0 METHODS

Desk Study

3.1 The Multi-Agency Geographic Information for the Countryside (MAGIC) online database was reviewed in October 2019 to identify the following ecological features (based on the Site's likely 'zone of influence' in respect of such features):

- Special Protection Areas (SPA), Special Areas of Conservation (SAC) and Ramsar sites within 10km of the Site (including possible/proposed sites)
- Sites of Special Scientific Interest (SSSI), National Nature Reserves (NNR), Local Nature Reserves (LNR) within 3km of the Site
- Other relevant data e.g. Ancient Woodland Inventory within 1km of the Site

3.2 Bedfordshire and Luton Biodiversity Recording and Monitoring Centre (BRMC) was contacted for details of any non-statutory nature conservation designations and records of protected/notable habitats and species. This information was requested for an area encompassing the Site and adjacent land within c. 2km of its central grid reference. This search area was selected to include the likely zone of influence of effects upon non-statutory designations and protected or notable habitats and species. Other online sources were reviewed for relevant biological records, reports and background information.

3.3 The Bedfordshire Bat Group was contacted for details and records of any protected/notable bat species. The information was requested from an area encompassing the Site and adjacent land within 2km of its central grid reference. Data was provided on 02 September 2019.

3.4 The Woodland Trust's online Ancient Tree Inventory was reviewed for known ancient or veteran trees within the Site and adjacent land.

3.5 In accordance with Natural England's Great Crested Newt Mitigation Guidelines (2001), a desktop search was undertaken to identify ponds within 500m of the Site which may have potential to support breeding great crested newts *Triturus cristatus*, using Ordnance Survey (OS) mapping, the MAGIC database and aerial photography.

3.6 All relevant desk study data are presented in Appendix C.

Field Surveys

Extended Phase 1 Habitat Survey

3.7 An extended Phase 1 habitat survey was carried out in fine and dry weather conditions on 28 August 2019 by Tom Clemence ACIEEM and

Laura Webb GradCIEEM, encompassing the Site and immediately adjacent habitats that could be viewed.

3.8 Phase 1 habitat survey is a method of classification and mapping wildlife habitats in Great Britain. It was originally intended to provide "…*relatively rapidly, a record of the semi-natural vegetation and wildlife habitat over large areas of countryside*." The Phase 1 habitat Survey method has been widely 'extended' beyond its original purpose to allow the capture of information at an intermediate level between Phase 1 and Phase 2 Habitat surveys. Here, the standard survey method has been 'extended' in this report to include the following:

- More detailed floral species lists for each identified habitat
- Descriptions of habitat structure, the evidence of management and a broad assessment of habitat condition
- Mapping of additional habitat types (e.g. hardstanding)
- Identification of Priority Habitats under Section 41 of the NERC Act
- Identification of Habitats Directive Annex I habitat types
- Evidence of, or potential for, European Protected Species (EPS) (including bats, great crested newt, dormouse and otter)
- Evidence of, or potential for, other protected species (including birds, reptiles, water vole, badger and certain invertebrates)
- Evidence of, or potential for, other notable species (including S41 Species of Principal Importance as well as notable, rare, protected or controlled plants and invertebrates)

3.9 Results of the extended Phase 1 habitat survey are presented on the Habitats Plan in Appendix A. Appendix D provides a list of floral species recorded in each habitat.

Further Survey Work

3.10 The following detailed field survey work was carried out between October 2019, with full methods and results provided in the relevant Appendices:

- Preliminary Bat Roost Assessment - Trees (Appendix F)
- Badger Survey (Appendix G)
- Great Crested Newt Habitat Suitability Index (Appendix H)

Limitations

3.11 There were no specific limitations to the desktop study. The phase 1 habitat survey was undertaken towards the end of the 'optimum' survey period for flora and habitats, and the grassland had been recently cut. It is likely therefore that some flora may not have been obvious at the time of the survey. However, it is not anticipated that this

limitation would have compromise the identification of broad habitat types.

3.12 Further surveys for bats, reptiles and great crested newts (GCN) could not be completed prior to the preparation of this EcIA due to the time of year and therefore some conclusions drawn are based on partial information. As such, a precautionary approach has been taken with regard to mitigation requirements, to ensure any unforeseen impacts can be reasonably accommodated for.

3.13 Limitations to species specific surveys are addressed in the relevant appendix.

Evaluation and Assessment

3.14 Ecological features are identified, evaluated and assessed with due consideration for the CIEEM Guidelines for Ecological Impact Assessment (2018), with detailed methods provided in Appendix E. It is, however, an established principle (CIEEM, 2018) that EcIA is an iterative process. Specialist advice on the avoidance and mitigation of the potential negative effects of the proposed development has been input from an early design stage.

3.15 It is also an established principle (CIEEM, 2018) that, wherever possible, potential negative effects should be avoided by 'embedded mitigation' or 'mitigation-by-design', as this gives more certainty over delivery, and demonstrates a well-designed scheme. This also ensures correct application of the 'Mitigation Hierarchy' (as advocated by BS42020:2013, and CIEEM, CIRIA & IEMA 2016).

4.0 BASELINE ECOLOGICAL CONDITIONS

Nature Conservation Designations

Statutory

4.1 There are no statutory designations covering any part of the Site.

4.2 Furthermore, no locally or nationally important statutory designations are present within 3km, or internationally important statutory designations within 10km of the Site.

Non-Statutory

4.3 Four non-statutory designations were identified within 1km of the Site, as described in table 1 below.

4.4 As LWS's are designated according to criteria applied in a county context, these sites are considered to be ecologically important at the County level.

Table 1. Statutory and non-statutory designations within search radii

Site Name & Designation	Distance & Direction from Survey Area	Special Interests or Qualifying Features
Non-statutory Designations within 1km		
Willington Moat County Wildlife Site (CWS)	c. 0.3km north	The CWS site includes a mosaic of habitats comprising marshy grassland, scrub and neutral grassland. Populations of great crested newts *Triturus cristatus* and reptiles are present at the Site.
River Great Ouse CWS	c. 0.4km north	The CWS site is recognised for its adjacent habitats and features which are considered part of the river system.
Great Barford Gravel Pits CWS	c. 0.8km north	The CWS site comprises UK BAP Priority Standing Open Water and Canals, with neutral grassland, mature trees, hedges and bare ground.
Blunham Disused Railway CWS	c. 0.8km north-east	The CWS site contains a good example of neutral grassland and also comprises scrub and secondary woodland.

Ancient Woodland

4.5 There is no designated Ancient Woodland covering any part of the Site or immediately adjacent land. No trees on or adjacent to Site are listed on the Ancient Tree Inventory.

Habitats and Flora

Notable Flora Records

4.6 BMRC provided a total of 111 records of 38 plant species from within the search area. Those of potential relevance to the Site include hoary plantain *Plantago media,* field scabious *Knautia arvensis,* quaking grass *Briza media* and harebell *Campanula rotundifolia,* all of which are near threatened, red listed species in England.

4.7 No notable plant species were recorded during the Site visit and there is no indication that the Site supports a particularly notable or diverse assemblage of flora.

Invasive Flora

4.8 BMRC have provided 26 records of 10 Schedule 9 invasive plant species. Those of potential relevance to the Site include Japanese knotweed *Fallopia japonica,* Indian balsam *Impatiens glandulifera,* and giant knotweed *Fallopia sachalinensis.*

4.9 No invasive plant species were recorded during the Phase 1 Habitat survey or during subsequent visits.

Habitats

4.10 The following habitats were recorded on-site and classified in line with current Phase 1 habitat species guidance (JNCC, 1990), as illustrated in Appendix A. Detailed species lists for each habitat are provided in Appendix D.

Poor semi-improved grassland

4.11 F1 comprises a c. 1.2ha field of poor semi-improved grassland within the eastern half of the Site. At the time of the Phase 1 survey the grassland had been recently mown, with a sword height of c. 10cm. This area of grassland comprises a combination of grass and herb indicative of nutrient improvement, species including cock's-foot *Dactylis glomerata*, barren brome *Bromus sterilis*, false oat-grass *Arrhenatherum elatius,* lesser trefoil *Trifolium dubium*, common mouse-ear *Cerastium fontanum* and goat's-beard *Tragopogon pratensis* were recorded.

4.12 F3 comprises a c. 0.1ha field of poor semi-improved grassland. This area is unmanaged with a limited diversity of herb species, being dominated by coarse grasses and ruderal species associated with nutrient improvement. Tussocks of cock's foot and false oat grass are present alongside occasional herb species such as herb Robert *Geranium robertianum*, yarrow *Achillea millefolium* and white dead nettle *Lamium album,* common nettle *Urtica dioica* is also frequent. Small areas of bramble *Rubus fruticosus* scrub are present to the west of this area.

4.13 Given the limited size and low species diversity of F1 and F3, these habitats are of low intrinsic ecological interest and they fail to fulfil any CWS selection criteria, as such this habitat falls below the threshold for determining ecological importance.

Amenity Grassland

4.14 F2 comprises a c. 0.6ha field of amenity grassland, at the time of the Phase 1 survey it appeared to have been recently mown with a short sward recorded throughout. It comprises grass species such as perennial rye grass *Lolium perenne*, cock's-foot and barren brome. Herb species include common mouse ear, dove's-foot crane's-bill *Geranium mole* and cut-leaved crane's-bill *Geranium dissectum*. A walled allotment area is located to the south of the field.

4.15 This habitat shows evidence of an intense management regime, limiting its structure and species diversity. In light of this and given its common and widespread presence within the wider landscape, on-site amenity grassland is considered to fall below the threshold for determining ecological importance.

Plantation Woodland

4.16 A plantation woodland 'copse' is present to the north-west of the Site, totalling an area of c. 0.06ha. It comprises early-mature oak *Quercus* sp., ash *Fraxinus excelsior*, field maple *Acer campestre* and coppiced hazel *Corylus avellana* trees. An arboriculture report produced by MacIntyre Trees (report ref: 019032_Fv1) in August 2019 identified that the trees are within fair structural condition, it is also suggested that in time this area would become a good and dense feature within the Site. The ground flora and understorey are relatively sparse, with common ivy *Hedera helix*, cow parsley *Anthriscus sylvestris* and oak saplings recorded, there is no evidence of recent management.

4.17 Plantain woodlands fall short of CWS and BAP Priority Habitat selection criteria for Bedfordshire. However, the habitat provides ecological interest for wildlife and is therefore ecologically important at the Local level.

Orchard

4.18 A small area of traditional orchard is present within the north of F2. It comprises a group of five established and one recently planted apple *Malus* sp. and pear *Pyrus* sp. trees.

4.19 This habitat falls short of CWS status primarily due to the trees including common fruit varieties of a semi-mature age. However it does meet the S41 Priority Habitats criteria for Traditional Orchard (groups of five or more fruit and nut trees with crown edges less than c. 20m apart) and hence is of conservation interest. With this in mind the orchard is of ecological importance at the Local level.

Hedgerows

4.20 H1 runs along a small hedge bank to the south of the Site and is c. 30m long, c. 4m high and c. 2m wide. The hedge shows little evidence of management within a sparse base and small gaps throughout. The hedgerow comprises hawthorn *Crataegus monogyna* and buckthorn *Rhamnus cathartica* with standard trees of ash and *prunus* sp.. Ground flora comprises black horehound *Ballota nigra*, cleavers *Galium aparine*, common ivy and common nettle.

4.21 H2, c. 30m long, c. 3.5m high and c. 2m wide, is located to along the south-western Site boundary adjacent to a residential garden. It comprises Leyland cypress *X Cuprocyparis leylandii*, hawthorn, bramble and bindweed *Convolvulus*, and appears to be unmanaged.

4.22 H3, c. 50m long, c. 10m high and c. 2-3m wide, is located along the southern Site boundary, adjacent to residential gardens. It comprises Lawson's cypress *Chamaecyparis lawsoniana* and Oregon-grape *Mahonia aquifolium* with bramble scrub at the base. The hedgerow appears to be unmanaged.

4.23 H4, c. 70m long, c. 3m high and c. 2m wide, is located along the northern Site boundary adjacent to residential gardens. It comprises hawthorn, with a small amount of dead elm *Ulmus* sp. and firethorn *pyracantha* sp. and appears to be unmanaged. Ground flora comprises green alkanet *Pentaglottis sempervirens*, ground ivy *Glechoma hederacea* and common mallow *Malva sylvestris*.

4.24 H5, c. 65m long, c. 2m high and c. 2m wide, is located within the centre of the Site. The hedgerow shows evidence of periodic management, facilitating establishment of a dense, well-formed hedgerow. It comprises dogwood *Cornus sanguinea*, hawthorn, buckthorn and field maple. Three cherry *Prunus* sp. trees and a lombardy-poplar *Populus nigra* var. *italica* are also present within this hedgerow.

4.25 H6, c. 25m long, c. 2m high and c. 2m wide, is located along the south-western boundary of F2. It comprises cherry laurel *Prunus laurocerasus* and branches from a plum overhanging the Site boundary, it appears to have had some management in recent years.

4.26 H7, c. 30m long, c. 5m high and c. 3m wide, is located between the walled allotment area and F3. It comprises a line of cypress and appears to be unmanaged.

4.27 Hedgerows H1, H4 and H5, comprising native species are of inherent ecological interest. None of the hedgerows qualify as species rich (Defra, 2007). However, H1, H4 and H5 meet the S41 Priority Habitats criteria for Hedgerows, comprising 80% or more native species

(Maddock, 2008). Hence, these hedgerows are of conservation importance and ecologically important at the Local level.

4.28 Hedgerows H2, H3, H6 and H7, being dominated by non-native species fall below the threshold for Local importance.

Trees

4.29 A number of scattered trees are present, primarily to the west of the Site; these include, ash, sycamore *Acer pseudoplatanus*, silver birch *Betula pendula*, oak and a number of non-native ornamental species. In regard to age/maturity, these range from young to early-mature in life-stage and appear to have been unmanaged since planting.

4.30 The trees within the Site fall short of the thresholds for CWS selection (Bedfordshire and Luton Local Sites Partnership, 2019). However, trees are of ecological interest and have the potential to provide a range of ecological functions. Hence, they are concluded to be of ecological importance at the Local level.

Tall ruderal

4.31 Two restricted areas of tall ruderal are present to the south of the Site. Species composition within both areas was typical of this habitat type, comprising abundant bramble with mugwort *Artemisia* sp., common nettle and black horehound.

4.32 Given the restricted on-site range and its ubiquity within the wider landscape, this habitat is considered to fall short of the criteria for determining ecological importance. It does however contribute to the wider variety of habitat at the Site.

Scrub

4.33 An area of dense scrub is located adjacent to H5, comprising suckering blackthorn which had been recently cut at the time of the Phase 1 survey. In addition, a small area of bramble scrub is present within F3.

4.34 Given the limited extent and diversity of the scrub habitats within the Site, this habitat is considered to fall short of the criteria for determining ecological importance.

Ornamental Planting

4.35 Areas of ornamental planting are present to the south-west of the Site, separating F2 and F3. It comprises shrub species including Oregon-grape, smoke tree *Cotinus coggygria*, *Euonymus japonicus*, barberry *Berberis* sp. and Mexican orange *Choisya ternate*.

4.36 None of these species are of native origin or known substantive interest to wildlife. Hence, this habitat is not considered to be of ecological importance.

Building

4.37 Two buildings are present on-site; B1 comprises an open sided single pitch building, with basic timber frame and single-skin corrugated metal sheet walls and roofing. B2 comprises a brick-built building with a cement bonded roof. Both of these buildings have negligible potential to support roosting bats, as discussed below, and therefore are not of ecological importance.

Fauna

Bats

4.38 The Bedfordshire Bat Group returned a total of 158 records of seven species of bat from within the search area, dating from 1991 to 2017. These include the following species: common pipistrelle *Pipistrellus pipistrellus*, soprano pipistrelle *Pipistrellus pygmaeus*, noctule *Nyctalus noctula*, brown long-eared *Plecotus auratus*, duabenton's *Myotis daubentonii,* natterer's *Myotis nattereri* and barbastelle *Barbastella barbastellus.* The closest records are of common pipistrelle bats c. 0.1km south and c. 0.2km east of the Site, dating from 1992. The closest roost record dates from 1999 and is c. 0.2km north of the Site. The record is of an unidentified bat which was found roosting in the extension of a building.

4.39 Boundary hedgerows and grassland are likely to support foraging and navigating bats. Semi-mature trees across the Site within boundary hedgerows and plantation woodland have the potential to support roosting features. As such a Preliminary Roost Assessment (PRA) of all trees within the Site was carried out, as detailed below.

4.40 Habitats in close proximity to the Site comprise arable fields to the east of the Site with boundary hedgerows and residential suburban areas to the north, south and west which may provide potential foraging, commuting and roosting opportunities for bats.

Preliminary Bat Roost Assessment (PRA)

4.41 All trees at the Site were inspected during a preliminary ground level assessment on 16 October 2019 to determine bat roost potential. A single lombardy-polar tree (Target note T6 on the Habitats Plan and T70 on the Tree Constraints Plan by MacIntyre Trees) has been identified as having moderate bat roost potential (Collins, 2016). Potential roosting features recorded were five wood pecker holes on the eastern elevation.

4.42 A full inspection with an endoscope was not possible due to the height of the features making them inaccessible. However, no evidence of roosting bats was identified from ground level.

4.43 Other trees within the Site are assessed as having negligible bat roosting potential (Collins, 2016).

4.44 The buildings within the Site are both assessed as having negligible bat roosting potential due to their construction types providing in sufficient thermal stability, light levels and exposure.

Activity Surveys

4.45 Remote monitoring surveys are scheduled to be carried out in spring 2020. The findings of this monitoring will identify species and relative levels of activity at the Site. This information will be used to inform any detailed mitigation measures in respect of bats for the Site (such as lighting design).

Badger

4.46 BMRC provided 34 records of badger *Meles meles* from within the search area, dating from 1995 to 2107. The closest record is of two deceased individuals c. 90m from the Site, dating from 1998. The closest record of a sett is located c. 0.8km north of the Site dating from 2007.

4.47 A dedicated badger survey was carried out on 16 October 2019 by Tom Clemence ACIEEM. No on-site setts were noted during the surveys; however, badger latrines, prints and mammal paths were identified within the north of the Site at the northern end of H5 (Target note T5 on the Habitats Plan).

4.48 In light of the above, badger setts are currently absent from the Site. However, they are confirmed as making use of the Site for foraging and dispersal and could in the future dig setts at the Site. Badgers are common and not considered to be of conservation importance. However, badgers are protected under the Protection of Badgers Act 1992 and are therefore included in the assessment of effects below in the context of this legislation.

Dormouse

4.49 BMRC provided no records of dormouse *Muscardinus avellanarius* from within the search area, with only a small number of known populations, primarily re-introduced, present in the wider area (i.e. Maulden Wood, Bedfordshire c. 11km north of the Site).

4.50 Whilst hedgerow and semi-natural woodland habitats are present on-site, they lack the structure and complex understorey required by dormice and are therefore suboptimal for this species. The Site also lacks connectivity to the wider landscape and therefore this species is considered likely absent and not considered further within this assessment.

Riparian Mammals

4.51 BMRC provided a total of nine records of otter *Lutra lutra* from within the search area, dating from 1998 to 2018. The nearest record is c. 0.7km north of the Site, dating from 2003 and located at the River Great Ouse CWS. Furthermore, two records of water vole *Arvicola amphibius* were provided from within the search area, dating from 1993 to 2001. The nearest record is c. 1.6km north-east of the Site, dating from 2001 and located at Great Barford Gravel Pits CWS.

4.52 The Site and the immediately adjacent surrounding area lack any suitable aquatic habitat for this species. Furthermore, there is no connectivity to the River Great Ouse, Great Barford Gravel Pits or other suitable aquatic habitat. Both otter and water vole are taken as likely absent from the Site and therefore not considered further in this assessment.

Other Mammals

Brown Hare

4.53 BMRC provided a total of 33 records of brown hare *Lepus europaeus* from within the search area, dating from 1990 to 2017. The closest record is c. 0.8km north of the Site.

4.54 Brown hare require large open habitats including arable and grassland areas. Whilst this habitat is available in the wider landscape, particularly to the east of the Site, the proximity of residential development surrounding the Site to the south and west suggest that brown hare is unlikely to make use of the Site.

Hedgehog

4.55 BMRC provided a total of 13 records of hedgehog *Erinaceus europaeus* from within the search area, dating from 1991 and 2014. The closest record is c. 1.2km south west of Site.

4.56 No evidence of hedgehog has been recorded during the Site surveys completed to date. However, a number of opportunities for hedgehog are present on-site, including log-piles, compost heaps, hedgerow and grassland adjacent to residential gardens, all of which could provide potential foraging, sheltering and hibernation opportunities.

4.57 Hedgehogs are listed as a species of principal importance under Section 41 of the Natural Environment and Rural Communities (NERC) Act (2006). As such, ecological enhancement measures have been set out to allow opportunities for hedgehogs to make use of garden habitats within the Site following construction.

Harvest Mouse

4.58 BMRC provided three records of harvest mouse *Micromys minutus* from within the search area, dating from 1978 to 2003. The closest record is c. 0.7km south-east of the Site, dating from 1978.

4.59 Harvest mice favour areas of reed beds, and well connected long sward grassland, both of which are absent from the Site. No evidence of this species was noted during the Site surveys with the habitats present providing suboptimal opportunities. This species is therefore taken as likely absent from the Site and as such is not considered further within this assessment.

Birds

4.60 BMRC provided a total of 11,386 records of 138 bird species from within the search area, dating from 2002 to 2017. Those of potential relevance to the Site, primarily a grassland habitat, include corn bunting *Emberiza calandra,* grey partridge *Perdix perdix,* lapwing *Vanellus vanellus,* linnet *Linaria cannabina,* meadow pipit *Anthus pratensis,* skylark *Alauda arvensis* and yellowhammer *Emberiza citronella*.

4.61 The Site provides suitable habitat for a range of common garden and grassland birds, with scattered trees and sections of hedgerow providing nesting opportunities and food sources. A single owl pellet and white staining, indicative of barn owl *Tyto alba*, was noted to the south of F3 (Target note T4 on the Habitats Plan). No evidence of nesting was recorded with the pellet and staining likely from an individual bird roosting, as opposed to nesting/breeding at this location.

4.62 Given the limited common habitats present, as well as their limited extent botanically or with regard to structural diversity, there is no indication that the Site itself is of significant ecological importance in respect of birds.

4.63 Nesting birds are protected under the Wildlife and Countryside Act 1981 (as amended), which includes protection against the damage or destruction of any nests whilst in use or construction. Therefore, nesting birds are included in the assessment of effects below within the context of this legislation.

Reptiles

4.64 BMRC provided nine records of three reptile species from within the search area including grass snake *Natrix natrix,* common lizard *Zootoca vivipara* and slow worm *Anguis fragilis* dating from 1978 to 2017. The closest records are of slow worm c. 0.3km north of the Site and grass snake c. 0.4km north of the Site, both located near the River Great Ouse.

4.65 The Site provides suitable habitat for a range of reptile species, with grassland and tall ruderal habitats providing foraging and sheltering opportunities. A number of log piles/ rubble piles are present to the west of the Site near the walled allotment (Target note T7 on the Habitats Plan), along with a compost heap (Target notes T2 and T3 on Habitats Plan). These provide potential refuges for sheltering and hibernating reptiles.

4.66 Two reptile species were identified on-site during the Phase 1 habitat survey; a single deceased grass snake on the eastern boundary (Target note T8 on the Habitats Plan) and five common lizards across the Site (Target notes T1 and T2 on the Habitats Plan).

4.67 Dedicated reptile surveys are scheduled for between March and May 2020 to fully assess the distribution, estimate population sizes and inform detailed mitigation.

4.68 Reptiles are protected under the Wildlife and Countryside Act 1981 (as amended), which includes protection from killing and injury. Moreover, both grass snake and common lizard are listed under Section 41 of the NERC Act as Priority Species.

4.69 Grass snake and common lizard are of conservation importance, therefore, until further surveys are completed, based upon habitat suitability and availability, the populations identified on-site have been given a precautionary assessment of importance at the Local level.

Amphibians

4.70 BMRC provided a total of 291 records of four amphibian species from within the search area, including great crested newt *Triturus cristatus*, smooth newt *Lissotriton vulgaris*, common frog *Rana temporaria* and common toad *Bufo bufo*.

Great Crested Newt

4.71 No ponds are present within the Site; however, two ponds have been identified within 250m of the Site boundary (P1 and P2, Pond Plan, Appendix H) with a further four waterbodies located between 250m and 500m from the Site (Ponds P3 – P6).

4.72 BMRC provided a total of 171 records of GCN, in addition to several wildlife sites, designated in part for their GCN populations. The closest known record is c. 300m south of the Site, at pond P6, dating from 2018. Records for Willington Moat CWS, c. 300m north-west were also provided from 1998 for P4 and P5 (Pond Plan, Appendix H). In addition, survey information submitted alongside planning application 18/03161/MAO, recorded a 'small' population of GCN within pond P3, c. 400m west of the Site.

4.73 The Site provides some terrestrial opportunities for amphibians, including hedgerows, scrub, woodland and areas of grassland. Opportunities for hibernating GCN are available within log piles and compost heaps situated on-site.

4.74 HSI assessments (Oldham *et al.,* 2000) were carried out in October 2019 on ponds where landowner access permission was given, public access was possible or ponds could be viewed from a public right of way. This included ponds P2 and P5 (Ponds Plan, Appendix H).

4.75 Pond P2, 160m south of the Site is a lined ornamental pond, heavily stocked with fish and has an HSI score of 0.5, below average (Oldham *et al.,* 2000). Pond P5, located c. 330m north of the Site, was only partly visible from public rights of way, hence aerial imagery was used to provide supplementary detail of its condition. P5 has an HSI score of 0.48, poor, however, as noted above had confirmed presence of GCN in 1998.

Table 2. Summary of information available on ponds within 500m of the Site.

Pond ref.	Distance from Site (m)	HSI score	Confirmed presence	Date of assessment	Dispersal barriers to Site
P1	160	-	-	-	c. 250m arable land
P2	250	0.5 below average	-	HSI, 2019	Barford Road and carpark
P3	400	-	Yes	Presence, 2018	Station Road and c. 200m of residential housing
P4	300	-	Yes	Presence, 1998	Chapel lane and c. 300m residential and arable land
P5	300	0.48 poor	Yes	HSI 2019, presence 1998	Chapel lane and c. 300m residential and arable land
P6	300	-	Yes	Presence, 2018	Sandy Road, Barford Road and c. 300m of arable, residential and car park

Importance

4.76 Amphibians, including GCN are known to be present within the local area. Though no aquatic habitat is present within the Site, a number of ponds are located within a 500m and 250m dispersal range. These ponds are separated from the Site by suboptimal arable habitats, a number of roads, residential housing and associated areas of hardstanding. Within this in mind, connectivity between the Site and off-site ponds is poor. Furthermore, the surrounding arable habitats and dominant grassland habitats on-site provide suboptimal terrestrial

opportunities for amphibians to disperse over and hibernate in, with on-site terrestrial opportunities limited to poorly connected hedgerows, scrub and plantation woodland.

4.77 In light of the above an assessment of risk of encountering GCN during the construction phase was carried out using Natural England's Rapid Risk Assessment tool. Under this assessment it was taken that c. 0.16ha of suitable terrestrial habitat would be effected within 100 and 250m of potential breeding ponds and beyond 250m from any breeding ponds. This assessment found that an offence is considered 'highly unlikely'.

4.78 Nonetheless, given their legislative protection, consideration has been given to safeguarding measures within the Assessment of Effects below.

Invertebrates

4.79 BMRC provided a total of 449 records of 139 invertebrate species from within the search area. Those of potential relevance to the Site include ghost moth *Hepialus humuli* and small heath *Coenonympha pamphilus,* both of which are UK BAP Priority species. Five Amber listed spiders were also provided from within the search area. None of the records were located within the Site.

4.80 The habitats on-site provide a reasonable structural diversity for a range of common and widespread invertebrates, however there is no indication that the Site is likely to support a particularly notable or large assemblage of terrestrial invertebrates. In light of this, invertebrates are not considered further within this assessment.

Future Baseline

4.81 The Site is presently under active grassland management, including the periodic cutting of the semi-improved grassland and frequent mowing of the amenity grassland. Management interventions maintain the on-site conditions in a relatively stable state. There is no known intention to cease this management, other than to accommodate the proposed development should planning permission be granted. As such, the future baseline status of important ecological features is not anticipated to vary significantly from that at present.

Summary of Ecological Features

4.82 Table 3 below summarises all important ecological features identified within the respective zones of influence, along with the geographic context of their importance:

Table 3. Summary of important ecological features and their geographic context

Ecological Feature	**Geographic Context of Importance and/or Protection Status**
All CWS	County
Plantation Woodland	Local
Orchard	Local
Hedgerows and Trees	Local
Bats	Local; Protected (Wildlife and Countryside Act, 1981[as amended]; The Conservation of Habitats and Species Regulations, 2017)
Badger	Protected (Protection of Badgers Act, 1992)
Birds	Protected (Wildlife & Countryside Act 1981 [as amended])
Reptiles	Protected (Wildlife & Countryside Act 1981 [as amended])
Great crested newts	Local; Protected (EPS)

5.0 ASSESSMENT OF EFFECTS

5.1 Outline planning permission is sought for residential development at the Site. The following impact assessment is based on the Proposed Site Plan General Arrangements (ref: 1168, number: 102, revision S1) prepared by Matchbox Architects on behalf of [redacted]

5.2 The construction phase of the proposed development will comprise the following:

- Removal of traditional orchard
- Removal of scattered trees
- Removal of sections of hedgerow to make way for development
- Construction of c. 33 residential dwellings
- Construction of associated gardens, parking, and access infrastructure
- The establishment of Public Open Space (POS) including wildflower grassland, orchard and wildlife pond
- Strengthening of boundary vegetation with new native species rich planting

5.3 The operational phase of the proposed development will comprise the following:

- Occupation of new residential dwellings
- Increase in human activity, including use of vehicles and presence of domestic pets
- Increased artificial lighting and anthropogenic noise
- Management of habitats within POS

Assumptions

5.4 The following assumptions have been made during the assessment of potential effects of the proposed development on Important Ecological Features. Although taken as part of the pre-mitigation scenario, these measures are referenced in the proceeding sections where integral to the mitigation strategy.

5.5 In accordance with BS42020:2013 (biodiversity code of practice for planning and development), it is assumed that a Construction Environmental Management Plan (CEMP) will be secured by planning condition and prepared at the detailed design stage for each phase of development. In addition to the construction phase impact avoidance and mitigation measures identified in the following sections, these will detail standard environmental control measures, including though not limited to the following:

- Implementation of strict protection measures for the root protection areas of retained trees and hedgerows, in accordance with BS5837:2012
- Standard best practice construction phase pollution prevention and control measures
- Sensitive working methods and timing to avoid direct impacts to nesting birds
- All working measures needed to comply with the terms of EPS derogation licencing specific to the development phase or works activity
- Updated ecological surveys, where necessary, to identify shifts in the baseline ecological condition (such as to support EPS derogation licence applications) in order that revised impact avoidance and mitigation measures can be adopted as required

5.6 In accordance with BS42020:2013, it is assumed that a Landscape and Ecology Management Plan (LEMP) will be secured by planning condition and prepared at the detailed design stage for each phase of development. These will set out measures for the establishment and management of newly created and retained habitats.

Assessment of Likely Significant Effects

Willington Moat CWS

Predicted Effects

5.7 The CWS can be accessed from a car park and pedestrian links, therefore wetland and grassland habitats at the CWS are potentially sensitive to increased recreational pressures. It is understood that there is existing access to the neutral and marshy grassland habitat to the west of the CWS, with the eastern area comprising a moat which is privately owned and surrounded by dense scrub.

5.8 Wetland habitats at the CWS are potentially sensitive to hydrological changes. However, given the separation of the Site from the CWS, and no direct watercourses present on-site, no significant impacts are anticipated in this regard.

5.9 Based on the above and small scale of the proposed development, no significant impacts are anticipated in relation to recreation. Overall, no significant adverse effects to the CWS are predicted.

River Great Ouse CWS

5.10 The Grange Estate c. 0.5km north of the Site is the closest part of the CWS from the Site. It forms part of the Bedford River Valley Park and comprises a mosaic of wet and dry woodland, wetlands and grasslands associated with the river. Surfaced paths for cyclists, walkers and horse riders are present and they connect to the surrounding public rights of way network in the area.

5.11 No significant adverse effects to this CWS are predicted given the managed paths that are already in place for visitors.

Other County Wildlife Sites (CWSs)

5.12 The remaining CWSs (Great Barford Gravel Pits CWS c. 0.8km north of the Site and Blunham Disused Railway CWS c. 0.8km north-east of the Site) are of a relative distance and separation from the Site and no obvious pathways of impact have been identified. Therefore, no significant adverse effects are anticipated to the remaining CWSs.

Plantation Woodland

Predicted Effects

5.13 The plantation woodland is to be retained within the proposed scheme at the Site. The proposed development is anticipated to increase the local population. In the absence of mitigation, a significant increase in recreational pressures from walkers and dog-walkers is anticipated within this plantation woodland. These effects have the potential to adversely impact the woodland and associated fauna.

5.14 Retained trees within the plantation woodland are vulnerable to damage to construction from passing construction and operational traffic and ground compaction.

5.15 In the absence of mitigation, the above pressures are predicated to result in an adverse effect, significant at the Local level.

Mitigation Measures

5.16 During the construction phase suitable protective fencing will be erected around the area and retained trees in accordance with arboricultural best practice BS 5837:2012 and will be installed for the duration of the construction phase to avoid damage to the root protection areas. This could also be secured by an appropriately worded planning condition.

5.17 A woodland management plan will be created and implemented in accordance with a suitably worded LEMP. The management will focus on maximising benefits to wildlife through selective thinning, rotational coppicing on a 6-8 year cycle and management of negative indicator species within the understorey and herb layer such as common nettle and dense bramble.

5.18 Informal recreation is anticipated within the woodland. To help direct this and reduce footfall within the wider woodland creation of a desire line/path along the north-western edge of the woodland is recommended.

Residual Effects

5.19 With the implementation of the above mitigation measures, no significant residual effects are anticipated to the plantation woodland.

Orchard

Predicted Effects

5.20 The on-site orchard habitat is scheduled to be removed, to make way for development.

5.21 In the absence of mitigation, the loss of this habitat is anticipated to result in an adverse effect at the Local level.

Mitigation Measures

5.22 A new area of orchard planting is proposed within the on-site POS. Species will comprise local fruit tree varieties such as Laxton's Advance, Lord Lambourne, Laxton's Superb and Laxton's Epicure. Each of these varieties are partly self-fertile and so would succeed within a small orchard area. Semi-vigorous MM106 rootstock (or equivalent semi-vigorous root stock) will be used to ensure good growth.

5.23 This habitat will be managed for the benefit of wildlife. Management details will be provided within a suitably worded LEMP which could be secured by way of planning condition.

Residual Effects

5.24 With the implementation of the above mitigation measures no residual effects are anticipated in respect of this habitat.

Hedgerows

Predicted Effects

5.25 With the exception of H7 all on-site hedgerows are scheduled to be fully or partially retained within the proposed development. Sections of H1 and H5 will be removed to make way for access and developable areas.

5.26 Retained hedgerows will be vulnerable to damage during construction from passing construction traffic and ground compaction.

5.27 As such, in the absence of mitigation the loss of this habitat and damage to retained habitats is anticipated to result in an adverse effect significant at the Local level.

Mitigation Measures

5.28 To compensate for the loss of on-site hedgerow, new hedgerow planting will be provided to strengthen the retained sections of hedgerow, furthermore new native, specie-rich hedgerow will be provided along the northern and eastern Site boundaries.

5.29 New planting will consist of native species-rich and locally appropriate hedging. All retained hedgerows will be protected in line with appropriate tree protection measures (i.e. BS 5837:2012).

Residual Effects

5.30 With the implementation of the above mitigation measures no significant adverse effects are anticipated.

Trees

Predicted Effects

5.31 A number of early-mature and semi-mature trees are scheduled to be removed within the proposed development. Retained trees are also vulnerable to damage from passing construction traffic and ground impaction. In the absence of mitigation this will result in an adverse impact, significant at the Local level.

Mitigation Measures

5.32 Tree removals will be kept to a minimum with opportunities to retain those existing within new POS and gardens taken where possible.

5.33 Where removals cannot be avoided, a number of new, native trees will be planted as compensation within new hedgerows along the eastern and northern boundary.

5.34 Suitable protective fencing will be erected around all on-site retained trees in accordance with arboricultural best practice BS 5837:2012 and will be installed for the duration of the construction phase to avoid damage to the root protection areas. This could also be secured by an appropriately worded planning condition.

5.35 Moreover, those retained trees will be subject to long term management as detailed within an appropriately worded LEMP, ensuring ongoing longevity and good health.

Residual Effects

5.36 With the implementation of the above measures, no residual adverse impacts are anticipated.

Bats

Predicted Effects

5.37 Development at the Site will necessitate the removal of grassland, tree and hedgerow habitats. These habitats represent typical bat foraging and commuting habitat and thus, in the absence of mitigation, will result in reduced foraging opportunities.

5.38 The Site is largely unlit. New artificial lighting of retained habitat during the construction and operational phases may lead to adverse

disturbance impacts to bats and other nocturnal wildlife, leading to a reduction of activity and diversity in these areas.

5.39 Though detailed activity surveys are yet to be complete at the Site (scheduled for between May and August 2020), it can be assumed with a reasonable level of confidence that foraging and commuting bats make use of the Site.

5.40 No roosts have been confirmed as present. However, the lombardy-poplar at Target Note T7 (T70 on the Tree Constraints Plan) is noted as having moderate bat roost potential. Roosting opportunities have been confirmed as negligible within the on-site buildings.

5.41 In the absence of mitigation the development has the potential to result in an adverse effect on bats, significant at the Local level.

Mitigation Measures

5.42 The provision of new and enhanced habitats within the Site, including wildflower grassland and new hedgerow and tree planting will provide a range of new foraging and commuting opportunities for any bat species which currently make use of the Site.

5.43 Remote monitoring surveys will be carried out in 2020 determine the species present on-site and their relative abundance. This information will be used to inform details of mitigation such as types and locations of integrated bat boxes and sensitivity to any new lighting within the Site. In the interim, the proposed development is noted as providing adequate opportunities to provide between five and fifteen integrated bats boxes. The location and specifications will be provided upon completion of the 2020 activity surveys.

5.44 Prior to the felling of the lombardy-poplar at Target Note T7 (T70 on the Tree Constraints Plan) an aerial inspection of the roost features will be carried out by a suitably qualified ecologist to confirm the presence or likely absence of roosting bats. In the event roosting bats are identified a mitigation licence from Natural England will be required to facilitate its removal. Alternative roosting opportunities would need to be delivered to mitigation for any loss of roosting features. As noted above, the development proposals provide adequate opportunities for this to be delivered where required.

5.45 Under the assumption that bats currently make use of the on-site habitats for commuting and foraging a sensitive Lighting Strategy will be implemented for both the construction and post development phases of the scheme. The Strategy will avoid and minimise artificial illumination of any retained or created hedgerow, woodland, grassland or tree planting in accordance with recommendations provided within the Bat Conservation Trust Bats and Artificial Lighting in the UK (BCT, 2018). This will include:

- Where lighting is required priority will be given to using downward directional lighting and minimisation of light spill into vegetated habitats, in particular trees, woodland and hedgerow.
- Upward-lighting will be avoided altogether;
- Lighting columns to be reduced to the lowest practical height to reduce horizontal light spill; and
- Light sources which emit minimal UV light will be sought (i.e. avoid lights which emit high blue wavelengths of 'cold' white light, in favour of 'warm white' with colour temperatures of below 3000k and peak wavelengths above 550nm) in accordance with BCT (2018) guidance.

5.46 The above measures could be secured by way of integrated design and/or a suitably worded planning condition.

Residual Effects

5.47 With the implementation of the above mitigation measures and subject to the completion and evaluation of outstanding survey works, no residual effects are anticipated in respect of bats.

Badger

Predicted Effects

5.48 Badgers and their setts are protected by the Protection of Badgers Act 1992. Badgers are known in the local area and make use of the Site for dispersal and foraging.

5.49 There is a risk of killing, injury or disturbance of badgers during construction (falling into open excavations or entering open ended pipework, above 150mm diameter) creating a risk of an offence under the above legislation, therefore appropriate mitigation measures have been set out below.

Mitigation Measures

5.50 The following precautionary measures will be implemented throughout the construction phase. These could be secured via a planning condition:

- A pre-construction check for any new setts
- Covering any open excavations with wooden boards, or fitting them with appropriate escape ramps (e.g. scaffold board), in order to prevent badgers falling into them and injuring themselves or becoming trapped.
- Monitoring of Site for any sett excavation during prolonged construction or landscaping works.

Residual Effects

5.51 With the implementation of the above mitigation measures no legal infringement is anticipated.

Birds

Predicted Effects

5.52 Wild birds, their active nests and their eggs are protected under the Wildlife and Countryside Act 1981 (as amended).

5.53 Based on the anticipated vegetation removal there is a risk of killing/ injury to nesting birds. This would cause an offence under the above legislation; particularly during the nesting bird season (March to August, inclusive) therefore mitigation measures have been set out below.

Mitigation Measures

5.54 Any vegetation clearance will take place outside of the bird nesting period (i.e. March to August, inclusive), or falling that confirmation by a suitability qualified ecologist that nesting birds are absent from the habitats to be cleared. These mitigation measures are a legal requirement, and would therefore be secured as such.

5.55 Six new bird boxes (e.g. Habibat or Schwegler) will be provided to compensate for any lost nesting opportunities. Boxes will be integrated within the fabric of the residential units to provide long-term opportunities for nesting birds.

Residual Effects

5.56 Based on the implementation of mitigation measures detailed no residual effects are anticipated.

Reptiles

Predicted Effects

5.57 All British reptile species are listed within Schedule 5 of the Wildlife and Countryside Act 1981 (as amended) and are afforded protection against killing and injury under parts of sub-section 9(1) of the Act. In addition, all British reptile species are S41 priority species in England.

5.58 Reptiles are confirmed to be utilising the Site; however, population estimates cannot be made until the completion of dedicated reptile surveys in 2020. During the construction phase, in the absence of mitigation there is risk of killing/ injury to reptiles (i.e. common lizard and grass snake) resulting in an adverse effect, significant at the Local level.

Mitigation Measures

5.59 The following mitigation principles are designed to avoid contravening protective legislation afforded to all British reptile species. A detailed strategy will be informed by the dedicated reptile survey results following survey completion in 2020.

5.60 Removal of potential refuges (log piles and compost heaps) will be done by hand outside of the hibernation period with reptiles physically removed to cover within a suitable habitat strip.

5.61 If a medium/high reptile population is recorded then a translocation area will be managed for the benefit of wildlife, including reptiles and will serve as a receptor area for reptiles which will be translocated from the proposed construction zone.

- Following installation of reptile fencing a reptile translocation exercise will be carried out during suitable weather conditions. Reptiles will be caught by a suitability qualified ecologist from the proposed construction zone and translocated to the receptor area, being released into areas of cover.
- Following the completion of the translocation exercise, vegetation clearance of the construction zone will commence.

5.62 In the event that a low number of reptiles are recorded on-site during the reptile surveys, a translocation exercise may not be considered necessary. However, robust avoidance/protection measures will be required, namely phased vegetation clearance of reptile habitat during the construction phase.

- The clearance of suitable reptile habitat will be timed to coincide with the reptile active season (taken to be March to September, in suitable weather conditions) and be carried out in accordance with the Reptile Mitigation Strategy, which will detail phased clearance methods designed to encourage on-site reptiles into retained habitats.
- Reptile proof fencing may be required to stop cleared areas of the Site becoming re-colonised by reptiles, this is dependent upon development timescales. Alternately, cleared areas could be stripped of top soil and kept vegetation free.

5.63 It should be noted that the on-site provision of POS is considered sufficient in area, anticipated structure and habitat types to accommodate mitigation for reptiles. However, as noted above a detailed Reptile Mitigation Strategy will be provided clearly outlining a mitigation approach informed by the completed reptile surveys (scheduled for between March and September 2020).

Residual Effects

5.64 Subject to the findings of the dedicated reptile surveys and implementation of appropriate mitigation measures, no residual effects are anticipated in respect of reptiles.

Great Crested Newt

Predicted Effects

5.65 Great crested newts are afforded protection under the Wildlife and Countryside Act 1981 (as amended) and the Conservation of Habitats and Species Regulations 2010. In combination this legislation protects great crested newts from deliberate capture, killing and injury, and intentional disturbance damage or destruction of a resting site or breeding place.

5.66 Great crested newts are known to be present within 500m of the Site and within the wider area. The proposed scheme at the Site would result in the loss of existing, albeit predominantly suboptimal, terrestrial habitat for GCN. As such, in the absence of safeguards there is potential for legal breaches in respect of this species.

Mitigation Measures

5.67 Loss of on-site woodland and hedgerow, optimal on-site terrestrial habitat, will be kept to a minimum. Loss of the grassland, scrub and ruderal habitats to make way for proposed development is not predicted to have a substantive adverse effect upon the wider great crested newt population. Moreover, landscaping and wildlife pond provision within the POS will provide long-term terrestrial and aquatic opportunities for GCN, mitigating for habitat losses associated with development.

5.68 It is acknowledged that the 'favourable conservation status' of the local GCN population is unlikely to be affected by the proposed scheme. Nonetheless, for the avoidance of legislative risk and potential delays during the construction phase it is advised that works be covered under a District Level License, or alternatively, a Non-licenced Method Statement could be followed. A Non-licenced Method Statement would include sensitive timing of works to avoid the GCN hibernation season with supervision from a suitability qualified ecologist for any sensitive vegetation clearance.

Summary of Effects

5.69 Table 4 below summarises the assessment of effects, including any mitigation and subsequent residual effects.

Table 4. Summary of effects

Important Ecological Feature	Likely Significant Effect and/or Legal Implication (before mitigation)	Avoidance & Mitigation Measures	Mechanism by which Mitigation is Secured	Residual Effects (after mitigation)
All CWS	Increased recreational pressure	None	N/A	No significant effect
Plantation Woodland	Increased recreational	Adherence to BS 5837:2012,	Design measures and	No significant

Important Ecological Feature	Likely Significant Effect and/or Legal Implication (before mitigation)	Avoidance & Mitigation Measures	Mechanism by which Mitigation is Secured	Residual Effects (after mitigation)
	pressure – Local adverse	woodland management provision of formalised boundary walking route	LEMP secured through planning condition	effect
Orchard	Removal of traditional orchard / loss of habitat – Local adverse	Planting of new orchard habitat	Design measures and LEMP secured through planning condition	No significant effect
Hedgerows and trees	Removal of hedgerow sections for vehicular and pedestrian access – Local adverse	Strengthening of boundary vegetation. Wildlife friendly management detailed within LEMP	LEMP secured through planning condition	No significant effect
Bats	Potential adverse effects from artificial lighting and loss of hedgerow habitats – Local adverse	New habitat creation, wildlife friendly management detailed within LEMP, sensitive lighting strategy	LEMP and Lighting Strategy secured through planning condition	No significant effect
Birds	Potential offences including damage or destruction of nests and eggs	Sensitive timing of works /nest checks by ecologist	Legal requirement/ appropriately worded planning condition	No significant effect
Badger	Potential offences including killing or injury of badger within uncovered pits/holes	Cover or provide escape ramps (e.g. scaffold board) for holes/pits over 1m deep	Legal obligation/ planning condition	No significant effect
Reptiles	Potential offences including killing or injury during construction – Local adverse	To be informed by dedicated surveys in 2020. Anticipated approach to include phased site clearance and habitat enhancement or translocation	Legal requirement/ appropriately worded planning condition	No significant effect
Great Crested Newts	Potential offences including killing or injury during construction – Local	Apply for inclusion within District Level Licence, or to	Legal requirement/ appropriately worded	No significant effect

Important Ecological Feature	Likely Significant Effect and/or Legal Implication (before mitigation)	Avoidance & Mitigation Measures	Mechanism by which Mitigation is Secured	Residual Effects (after mitigation)
	adverse	be informed by dedicated surveys in 2020. Habitat creation, including wildlife pond.	planning condition	

Cumulative Effects

5.70 Due to the scale and nature of the proposed development, a detailed assessment of potential cumulative effects has not been undertaken.

Compensation

5.71 No significant residual negative effects on important ecological features are anticipated to result from the proposed development, following the inclusion of impact avoidance and mitigation measures described above.

Enhancement

5.72 The development proposals include opportunities for landscape planting enhancements which will make positive contributions to on-site biodiversity.

5.73 New habitat creation and enhancement of existing habitats will provide opportunities for species confirmed to be present on-site at baseline, such as nesting birds and reptiles. In addition, enhancements for the benefit of wider biodiversity will be delivered as part of the proposed development, as identified below. Further details will be set out in a LEMP at the detailed design stage, however as an indicative guide:

- Inclusion of plant species of known wildlife value within the landscaping scheme, including night-scented varieties to benefit bats.

- Wildlife pond: a new wildlife pond will be provided within the Site, potential locations include south or north-east of the retained on-site plantation woodland. This will be designed in accordance with good wildlife pond design and feature a stepped profile, allowing for ephemerally wet and permanently wet areas of the pond to exist, native aquatic planting will be provided at the margins. The pond creation and stocking with appropriate native flora will be detailed within the LEMP. The pond will be protected from recreational disturbances by using a traditional timber clef fencing

to limit access, particularly from dog-walkers. An access gate will be provided to allow ongoing management and maintenance.

- Selective thinning of Plantation Woodland: Selective thinning of the plantation woodland will give selected trees more space and light to grow and will allow a greater structural diversity to develop within the copse.

- Creation of log piles: Timber generated from tree clearance works at the Site will be used to make at least three log piles for wildlife benefit. These will be sited within areas where they will be least disturbed. New material can be added as required following any future management works.

- Provision of hedgehog gaps: Hedgehogs have been scoped out of detailed assessment and no specific mitigation is proposed, however it is important that opportunities for hedgehogs to move through the landscape are preserved. Although not strictly an 'enhancement' measure, provision of hedgehog-friendly gravel boards or equivalent, providing a minimum 150mm x 150mm gap, will be used to maintain permeability for hedgehogs across the development and associated gardens. The number and location of hedgehog gaps will be determined at the detailed design stage and set out within the LEMP.

- Demarcation: Where appropriate habitats within the Site, particularly the wildlife pond, which are to be managed for the benefit of wildlife will be demarcated with knee rails, timber clef fencing and bollards. The demarcation will serve to provide some protection of this area and contribute to a clear long-term management strategy, enabling areas designed to benefit of wildlife to be readily identified from those which are to provide more formal space.

- Understorey planting: the areas of newly created orchard, hedgerows and existing woodland will be enhanced through the provision of appropriate understorey planting to promote a complex habitat structure, as well as addition floral diversity. Where required, the ground will be suitably prepared to promote successful establishment. Detail of this measure will be provided within a suitably worded LEMP.

Monitoring

5.74 Several monitoring visits will be required by suitably qualified ecologists to help ensure the fulfilment of the above measures and provide on-the-ground advice to the appointed contractors. The key purpose and timings of these visits will be as follow:

- One visit at commencement or early in the construction phase to brief contractors and agree placement and orientation of bird and bat boxes.
- One visit later in construction phase to ensure bat and bird boxes and hedgehog holes have been correctly provided, alongside provision of habitat creation.

5.75 Where appropriate the above visits will form part of a suitably worded planning condition and/or LEMP obligations.

6.0 CONCLUSIONS

6.1 In the absence of any mitigation measures, the proposed development would be anticipated to have, at most, negative effects significant at the **Local** level.

6.2 However, with the implementation of mitigation and precautionary measures, as proposed with this scheme, the development is not anticipated to result in any significant residual negative effects on important ecological features.

6.3 It should be noted that although dedicated surveys are yet to be completed for reptiles, bat activity and GCN (only required if District Level Licencing is not applied), the baseline information currently available and presented herein is considered sufficient to predict the magnitude of ecological impacts arising from the proposed development. With this in mind, the development proposals are assessed as providing sufficient opportunities to deliver mitigation measures where required.

6.4 Based on successful implementation of avoidance, mitigation and enhancement measures set out herein, the scheme is considered to accord with all relevant nature conservation legislation, and local planning policy.

6.5 The proposed layout will provide benefits for wildlife in the form of additional habitats, with the opportunity to provide additional biodiversity enhancement measures alongside the new housing. The measures set out herein can be secured through appropriate conditions imposed upon any planning consent, and the development may therefore be delivered without harm to nature conservation interests.

7.0 REFERENCES

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Appendix A

Habitats Plan & Photosheet

N

- Site boundary
- SI — Poor semi-improved grassland
- A — Amenity grassland
- Plantation woodland
- Trees
- Hedgerow
- Orchard
- Introduced shrub/ ornamental planting
- Dense scrub
- Tall ruderal
- Building
- Hn — Hedgerow number
- Bn — Building number
- Fn — Field number
- n — Target notes:

1. 1 x common lizard *Zootoca vivipara*
2. Area of piled grass cuttings, fence boards and roofing felt - 4 x common lizards
3. Rubble pile and compost heap
4. Owl pellet
5. Badger latrine
6. T70 lombardy poplar with moderate bat potential
7. Walled allotment
8. Deceased grass snake *Natrix natrix*

0 10 20 30 40 50metres

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Project	Barford Road, Willington		Date	October 2019	Drawing No. CSA/4439/100
Drawing Title	Habitats Plan		Scale	NTS	Rev -
Client	Fisher German on behalf of Ross Jackson [redacted]		Drawn	LW	Checked JW

Plate 1. F1 Recently mown, poor semi-improved grassland

Plate 2. Log/ brash piles (Reptile refugia present on-site). Lombardy-poplar on left

Plate 3. Walled allotment and B2 on right

Plate 4. B1 a single sided, single pitched roof building

Plate 5. F3 unmanaged poor semi-improved grassland with areas of tall ruderal

Plate 6. F2 amenity grassland

Photo 7. Traditional orchard within F2

Photo 8. Ornamental planting within F2

Photo 9. H4 to the north of F2

Photo 10. Plantation Woodland

Appendix B

Legislation and Planning Policy

The **Conservation of Habitats and Species Regulations 2017** transposes Council Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Fauna and Flora, and aspects of Council Directive 79/409/EEC on the Conservation of Wild Birds, into UK domestic law. The Regulations make prescriptions for the designation and protection of Sites of Community Importance ('European sites', e.g. Special Areas of Conservation and Special Protection Areas) and European Protected Species (EPS).

The **Wildlife and Countryside Act 1981** (as amended, principally by the Countryside and Rights of Way Act 2000) forms the basis for protection of statutory designated sites of national importance (e.g. Sites of Special Scientific Interest; SSSIs) and native species that are rare and vulnerable in a national context. Additionally, badgers are protected under the **Protection of Badgers Act 1992**.

Section 40(1) of the **Natural Environment and Rural Communities (NERC) Act 2006** states that each public authority, "must, in exercising its functions, have regard, so far as is consistent with the proper exercise of those functions, to the purpose of conserving biodiversity." This legislation makes it clear that planning authorities should consider impacts to biodiversity when determining planning applications, with particular regard to the Section 41 (S41) lists of 56 habitats and 943 species of principal importance. The UK Biodiversity Action Plan (BAP) has been superseded by the Biodiversity 2020 Strategy, which continues to prioritise the S41 lists, however Local BAPs continue to influence biodiversity management and conservation effort, including through the spatial planning system, at the local scale.

The **National Planning Policy Framework (2019)** (NPPF) sets out the government planning policies for England and how they should be applied. With regards to ecology and biodiversity, Chapter 15: Conserving and Enhancing the Natural Environment, paragraph 170, states that the planning system and planning policies should minimise impacts on and provide net gains for biodiversity, including by establishing coherent ecological networks that are more resilient to current and future pressures.

Paragraph 175 sets out the principles that local planning authorities should apply when determining planning applications:

- If significant harm to biodiversity resulting from a development cannot be avoided (through locating on an alternative site with less harmful impacts).

- Development on land within or outside a Site of Special Scientific Interest, and which is likely to have an adverse effect on it (either individually or in combination with other developments), should not

normally be permitted. The only exception is where the benefits of the development in the location proposed clearly outweigh both its likely impact on the features of the site that make it of special scientific interest, and any broader impacts on the national network of Sites of Special Scientific Interest.

- Development resulting in the loss or deterioration of irreplaceable habitats (such as ancient woodland and ancient or veteran trees) should be refused, unless there are wholly exceptional reasons and a suitable compensation strategy exists.

- Development whose primary objective is to conserve or enhance biodiversity should be supported; while opportunities to incorporate biodiversity improvements in and around developments should be encouraged, especially where this can secure measurable net gains for biodiversity.

The **Government Circular 06/2005**, which is referred to within the NPPF, defines statutory nature conservation sites and protected species as a material consideration in the planning process.

Local planning policies of relevance to ecology, biodiversity and/or nature conservation have been set out in Table B.1 below.

Table B.1. Summary of regional and local planning policy relating to ecology

Policy	Summary
Bedford Borough Council Development Plan Document – Core Strategy and Rural Issues Plan (April 2008)	
Policy CP25 - Biodiversity	The biodiversity and geodiversity of the borough and in particular priority habitats, species and geodiversity features, will be protected and where appropriate enhanced. Where harm to biodiversity and/or geodiversity is likely to be a result of development, appropriate mitigation and/or compensation will be required. Any replacement assets should be of a comparable or enhanced value.
Bedford Borough Council Local Plan (adopted 2002)	
Policy NE3: Nature Conservation	The Borough Council will not permit development that may i) directly or indirectly destroy or adversely affect a Local Nature Reserve, County Wildlife Site or Regionally Important Geological/Geomorphological Site or ii) destroy or have an adverse effect on other sites supporting national, regional or County Rare Species unless alternative provisions can be agreed or it can be clearly demonstrated that there are reasons for the proposal which outweigh the need to safeguard the nature conservation value of the site or feature. In all cases such damage will be kept to a minimum and where appropriate the Borough Council will consider the use of conditions and/or planning obligations to provide compensatory measures.
Policy NE4: Nature Conservation	In considering proposals for development, the Borough Council will seek to protect and retain trees and hedges which it considers to be of amenity, landscape or wildlife significance. Where development is permitted, conditions will be applied and, where appropriate, legal agreements sought to: i) secure landscaping, tree and hedgerow planting on or

Policy	Summary
	adjacent to such sites appropriate to the character of the development and its setting, including using native species of local origin where suitable; ii) protect existing and new planting; iii) secure structural planting where required; iv) secure the conditions to allow existing or newly planted trees to grow unhindered to full maturity; v) provide for the reinstatement or replacement of such features consequently lost or adversely affected.
Policy NE8: Nature Conservation	Where development is permitted which results in the loss of natural history sites, habitats or features, the Borough Council will seek to secure a replacement asset of a comparable or enhanced nature conservation value. A detailed survey of the site or feature will be required before such development is permitted. In determining the nature of such required replacement provision, full consideration should be given to the following: i) size; ii) diversity of species and habitat, including rarity and national/local significance, soil type and quality; iii) the relationship of the site or feature in question to other assets.
Bedford Borough Council <u>Proposed</u> Local Plan 2030 (Draft Plan for Submission: September 2018, currently in consultation phase)	
Policy 40 – Retention of Trees	In considering proposals for development all of the following criteria will apply: i. Existing trees will be protected where they make a significant contribution to the local landscape, or amenity of the site, or have wildlife significance. ii. The Council will protect existing trees and trees planted in accordance with approved landscaping schemes through the making of Tree Preservation Orders where appropriate or necessary. iii. Existing trees on and adjacent to a site must be recorded following guidance in the relevant British Standard including an assessment for ancient or veteran tree status, also including orchard status where appropriate. The Council will as a condition of any planning permission granted, require details as to how trees, hedges and hedge banks will be protected prior to and during and after construction. iv. No building, hard surfacing drainage or underground works will be permitted that does not accord with the principles of the relevant British Standard unless, exceptionally, the Council is satisfied that such works can be accommodated without harm to the trees concerned or there are overriding reasons for development to proceed. v. Planning permission will be refused for development resulting in the loss or deterioration of ancient woodland and the loss of aged or veteran trees found outside ancient woodland (including from indirect impacts such as increased visitor pressure), unless the need for, and benefits of, the development in that location clearly outweigh the loss.
Policy 41 – Hedgerows	Any hedgerows should be retained on development sites, unless there are overriding benefits that justify their removal. Where removal is deemed necessary, details addressing the criteria under the Hedgerow Regulations 1997 (as amended) shall be submitted to demonstrate the validity for removal and details of the replacement hedgerows. Replacement hedgerows shall be of an equal scale, native and species rich

Policy	Summary
	and should be provided where possible, elsewhere on the development site. Where there are gaps in the existing hedgerows on the site, the development should provide for additional hedgerow planting.
Policy 43S – Protecting biodiversity and geodiversity	Planning applications for development are required to assess the impact of the proposal on the biodiversity and geodiversity value of the site and its surroundings. This should be carried out by a suitably qualified professional in accordance with industry standards. A proposal which is likely to have an adverse effect on a Site of Special Scientific Interest (SSSI) will not be permitted unless there are exceptional reasons that outweigh the harm to the site. Development should be designed to prevent any adverse impact on locally important sites, species and habitats of principal importance contained within the Natural Environment and Rural Communities (NERC) Act 2006. However, in these circumstances where an adverse impact is unavoidable, the application shall demonstrate how the harm will be reduced through appropriate mitigation. Where protected species, priority habitats of principal importance are adversely affected, the application will need to demonstrate how the proposed mitigation will reduce the adverse effects. If adequate mitigation is not possible, the application will need to demonstrate that the overriding reasons outweigh the impacts on the biodiversity and geodiversity of the borough.
Policy 44 – Enhancing biodiversity	Development proposals should provide a net increase in biodiversity through the following: i. Enhancement of the existing features on the site; or ii. The creation of additional habitats on the site; or ii. The linking of existing habitats to create links between ecological networks and where possible, with adjoining features.
Policy 45 – River Great Ouse	Development proposals along and adjoining the River Great Ouse will be required to: i. Improve access to the River Great Ouse including canoe portage areas and related facilities will be supported as outlined in the 2011 Bedford Waterspace Study (or as amended) where it can be demonstrated that there will be no harmful impact on the character or environment and ii. Deliver improvements as relevant to the site and area of the river in accordance with the 2011 Bedford Waterspace Study and iii. Ensure that new river moorings have pedestrian access and vehicle access to an adopted road, unless it can be demonstrated that there is an alternative means of access and iv. Ensure that new marinas have access to an adopted road and car parking is provided in accordance with the Parking Standards for Sustainable Communities: Design and Good Practice supplementary planning document to accommodate visitors' and residents' vehicles.

Appendix C

Desk Study Information

MAGIC

4439_10km_Designated Site Check

Legend

- Ramsar Sites (England)
- Proposed Ramsar Sites (England)
- Special Areas of Conservation (England)
- Possible Special Areas of Conservation (England)
- Special Protection Areas (England)
- Potential Special Protection Areas (England)

Projection = OSGB36
xmin = 485800
ymin = 239300
xmax = 536700
ymax = 262400

0 2 4
km

Map produced by MAGIC on 22 October, 2019.

Site Check Report Report generated on Tue Oct 22 2019
You selected the location: Centroid Grid Ref: TL11594987
The following features have been found in your search area:

Ramsar Sites (England)
No Features found

Proposed Ramsar Sites (England)
No Features found

Special Areas of Conservation (England)
No Features found

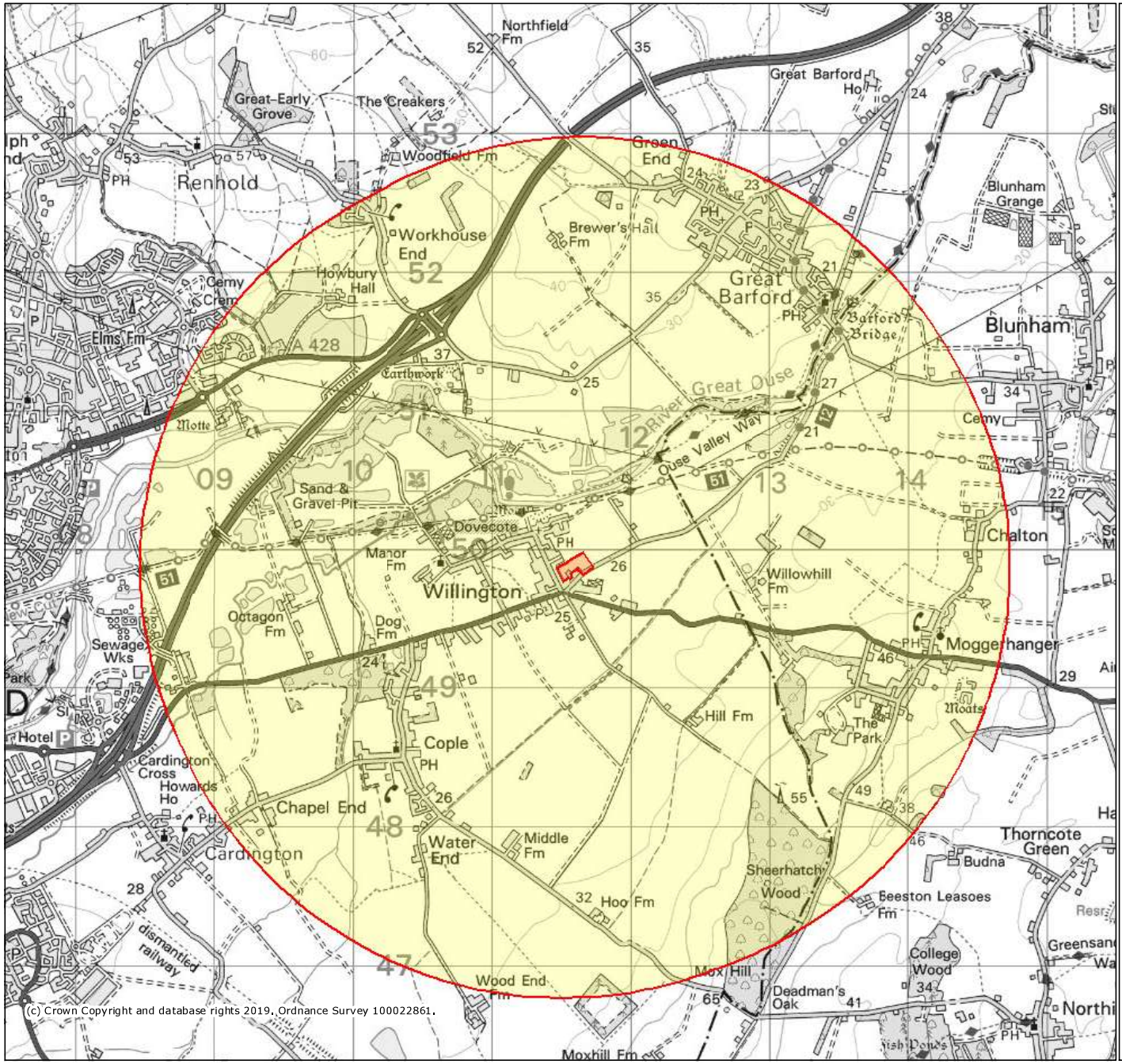
Possible Special Areas of Conservation (England)
No Features found

Special Protection Areas (England)
No Features found

Potential Special Protection Areas (England)
No Features found

MAGIC

4439_3km_Designated Site Check



Legend

- Local Nature Reserves (England)
- National Nature Reserves (England)
- Sites of Special Scientific Interest (England)

Projection = OSGB36
xmin = 503800
ymin = 246400
xmax = 519200
ymax = 253900

0 0.6 1.2
km

Map produced by MAGIC on 22 October, 2019.

Site Check Report Report generated on Tue Oct 22 2019
You selected the location: Centroid Grid Ref: TL11594987
The following features have been found in your search area:

Local Nature Reserves (England)
No Features found

National Nature Reserves (England)
No Features found

Sites of Special Scientific Interest (England)
No Features found

Appendix D

Habitats and Flora Species List

Table D. Habitats and Flora Species List

Site name	**4439** Barford Road, Willington, Bedford
Survey date and surveyor	28/08/2019 LW & TC

Scientific name	**Common name**	**Habitat Type**								
		Poor semi-improved	Amenity Grassland	Plantation Woodland	Trees	Hedgerows	Orchard	Ornamental Planting	Dense Scrub	Tall Ruderal
Fern										
Pteridium aquilinum	Bracken									x
Herb species										
Achillea millefolium	Yarrow	x								
Anthriscus sylvestris	Cow parsley	x		x						
Artemisia vulgaris	Mugwort	x								x
Ballota nigra	Black horehound									x
Berberis sp.	Barberry							x		
Cerastium sp.	Mouse-ear	x	x							
Convolvulus arvensis	Field bindweed	x								
Geranium dissectum	Cut-leaved crane's-bill		x							
Geranium molle	Dove's-foot crane's-bill		x							
Geranium robertianum	Herb Robert	x								
Heracleum sphondylium	Hogweed		x							
Lamium album	White dead-nettle	x								
Malva sylvestris	Common mallow	x								
Plantago lanceolata	Ribwort plantain	x								
Pyracantha sp.	Firethorn							x		
Raphanus raphanistrum	Wild radish	x								
Silene latifolia	White campion		x							
Tragopogon pratensis	Goat's-beard	x								
Trifolium dubium	Lesser trefoil	x								
Urtica dioica	Common nettle	x								x
Grasses										
Anisantha sterilis	Barren brome	x	x							
Arrhenatherum elatius	False oat-grass	x								
Dactylis glomerata	Cock's-foot	x	x							
Festuca sp.	Fescue	x								
Lolium perenne	Perennial rye grass		x							
Woody species										
Coniferous										
Cupressus sp.	Cypress				x	x				
Juniperus sp.	Juniper				x					
Picea abies	Norway spruce				x					
Thuja plicata	Western red cedar							x		
Broadleaved										
Acer campestre	Field maple			x		x				
Acer pseudoplatanus	Sycamore				x					
Alnus cordata	Italian alder				x					
Betula pendula	Silver birch				x					
Buxus sempervirens	Box							x		
Buddleja davidii	Buddleia	x								
Castanea sativa	Sweet chestnut				x					
Cercis siliquastrum	Jusas tree				x					
Choisya ternate	Mexican orange							x		
Cornus sanguinea	Dogwood					x				
Corylus avellana	Hazel			x						
Cotinus coggygria	Smoke tree							x		
Crataegus monogyna	Hawthorn					x				
Eucalyptus sp.	Gum				x					
Euonymus japonicus	Variegated euonymus							x		
Fraxinus excelsior	Ash			x	x					
Garrya elliptica	Silk tassel bush							x		
Hedera helix	Common ivy	x		x						
Ilex aquifolium	Holly	x								
Juglans nigra	Black walnut				x					
Juglans regia	Walnut				x					
Liriodendron	Tulip tree				x					
Mahonia aquifolium	Oregon-grapes							x		
Malus sp.	Apple						x			
Malus sylvestris	Crab Apple				x					
Populus nigra var. italica	Lombardy-poplar				x					
Prunus avium	Cherry				x					
Prunus domestica	Plum				x			x		
Prunus laurocerasus	Cherry laurel							x		
Prunus spinosa	Blackthorn								x	

Appendix E

Evaluation & Assessment Methods

Ecological features are evaluated and assessed with due consideration for the Chartered Institute of Ecology and Environmental Management (CIEEM) 2018 Guidelines for Ecological Impact Assessment (EcIA). For clarity, the evaluation and assessment process adopted within this EcIA is set out below.

Establishing Potentially Important Ecological Features

Ecological features are assessed where they are considered to be important, and where they may be impacted by a proposed development. A feature may be considered important for a variety of reasons, such as quality, extent, rarity and/or statutory protection. Table E.1 below sets out a non-exhaustive list of ecological features that are typically considered, along with key examples:

Table E.1. Potentially important ecological features (adapted from CIEEM 2018)

Potentially Important Ecological Features	**Typical examples**
Statutory designated sites under international conventions or European Legislation	Wetlands of International Importance (Ramsar sites), Special Areas of Conservation (SAC), Special Protection Areas (SPA)
Statutory designated sites under national legislation	Sites of Special Scientific Interest (SSSI), National Nature Reserves (NNR, Local Nature Reserves (LNR)
Non-statutory, locally designated wildlife sites	Local Wildlife Sites (LWS), County Wildlife Sites (CWSs), Sites of Importance for Nature Conservation (SINCs)
National biodiversity lists	Habitats or Species of Principal Importance for the Conservation of Biodiversity (Section 41, NERC Act 2006), Ancient Woodland Inventory
Local biodiversity lists	Local Biodiversity Action Plan (BAP) priority species or habitats
Red Listed / Rare Species	Species of conservation concern, Red Data Book (RDB) species, Birds of Conservation Concern, nationally rare and nationally scarce species
Legally Protected Species	E.g. species listed under Sch.5 of the W&C Act 1981, or Sch.2 of the Hag. Regs. 2017
Legally Controlled Species	E.g. species listed under Sch.9 of the W&C Act 1981

It should also be noted that the social, community, economic or multi-functional importance attributed to ecological features are not assessed as they fall out with the scope of this assessment.

Establishing Likely Zone of Influence

The 'zone of influence' for a project is the area over which ecological features may be subject to significant effects as a result of the project and associated activities. The project's zone of influence varies across different ecological features, which have different vulnerabilities and sensitivities. For the purposes of this assessment, the following zones were considered:

- International statutory nature conservation designations up to 10km from the Site
- National and local statutory nature conservation designations up to 3km from the Site
- Non-statutory locally designated wildlife sites up to 1km from the Site

These arbitrary distances are considered sufficient for identifying the nature conservation designations which could be subject to significant effects. However, it is acknowledged that in certain circumstances effects beyond these distances are possible and should be considered as far as is reasonably practicable to do so.

For other ecological features, such as habitats and species, the appropriate zone of influence is described and justified as appropriate within the report, depending on their respective sensitivity to an environmental change.

The results of professionally accredited or published scientific studies have been used and referenced, where available, to establish the spatial and temporal limits of the biophysical changes likely to be caused by specific activities, and to justify decisions about the zone of influence.

Geographic Context and Significance Criteria

The importance of ecological features, as well as the significance of any likely impacts and their effects, are considered here within a defined geographic context:

- International
- National
- Regional
- County
- Local

The size, conservation status and the quality of features are all relevant in determining their importance and assigning this to the geographic scale. Where the importance of a feature is considered to fall below the Local scale, they are scoped out of detailed assessment.

Impacts and their effects are taken to be significant where they support or undermine biodiversity conservation objectives, with the scale of significance defined according to the above geographic context. Where an impact or effect is unlikely to be perceptible at a Local scale, this is taken to be not significant.

Characterising Ecological Impacts and their Effects

Where likely significant ecological impacts and effects are identified in connection with the proposed project, these are considered and described with reference to the following characteristics (where this is helpful in accurately portraying the ecological effect and determining the scale of significance):

- Positive or negative (i.e. does the anticipated change accord with nature conservation policies and objectives?)
- Extent (i.e. the spatial area over which the impact or effect may occur)
- Magnitude (i.e. the quantified size, amount, intensity or volume)
- Duration (i.e. the timeframe over which the impact or effect may occur, in both human and ecological terms)
- Frequency and timing (i.e. the number of times an activity occurs, where this is likely to influence the effect)
- Reversibility (i.e. is spontaneous recovery possible or may the effect be counteracted by mitigation?)

Appendix F

Preliminary Bat Roost Assessment

Introduction

Survey design, data analysis and interpretation set out herein has been undertaken with due consideration for the Bat Conservation Trust (BCT) guidelines 3rd Edition (BCT, 2016).

Legislation

All species of British bats are legally protected under Regulation 43 of the Conservation of Habitats and Species Regulations 2017. These Regulations make it an offence to:

- Deliberately capture, injure, or kill a bat;
- Deliberately disturb bats, impairing their ability to survive, breed, reproduce or rear/nurture their young;
- Damage or destroy a breeding site or resting place used by bats; or
- Be in possession of, transport, sell, exchange or offer to sell/exchange a bat (dead or alive) or any part of a bat.

All bats and their roosts in England, Scotland and Wales were originally protected under the Wildlife & Countryside Act 1981. Subsequent amendments to the legislation for England and Wales has removed bats from most of the provisions of the Act, however it remains an offence to:

- Intentionally or recklessly disturb a bat while it is occupying a structure or place which it uses for shelter or protection; or
- Intentionally or recklessly obstruct access to any structure or place that a bat uses for shelter or protection.

Disturbance of bats is covered by both the 2017 Regulations and the 1981 Act. Disturbance that impairs survival or successful reproduction would be covered by the Regulations, while disturbance of individual bats within roosts is covered by the Act.

It is important to note that bat roosts are protected throughout the year, regardless of whether or not bats are present at the time. Under the Conservation of Habitats and Species Regulations the offence of damaging or destroying a breeding site or resting place of bats is not subject to any legal defence, i.e. an offence will have been committed even if the damage or destruction occurs accidentally.

Licensing

Where development is proposed that would result in an offence under the Habitats and Species Regulations a European Protected Species (EPS) licence needs to be granted by Natural England to permit an act that would otherwise be unlawful. This provides for a specific derogation from the

legislation, to prevent a legal infringement occurring. To obtain an EPS licence for development it must be demonstrated that the purpose of the act to be licensed is for:

- *"preserving public health or public safety or other imperative reasons of overriding public interest including those of social or economic nature and beneficial consequences of primary importance for the environment"* (Regulation 55(2)(e)).

In addition Natural England will not grant an EPS licence unless they are satisfied that:

- *"There is no satisfactory alternative" (Regulation 55(9)(a)); and*
- *"The action authorised will not be detrimental to the maintenance of the population of the species concerned at a favourable conservation status in their natural range"* (Regulation 55(9)(b)).

Methods

Preliminary Roost Assessment

The aim of the preliminary roost assessment is to determine the suitability of a tree or building for roosting bats. Where significant potential for, or evidence of, roosting bats is identified, further bat roost surveys are generally necessary to determine the presence or likely absence of a roost, and to characterise any roost present. The methods described below have been followed with due consideration of the current guidelines (BCT, 2016).

Structures

A detailed inspection of the exterior and interior of structures at the Site was undertaken to (i) identify any Potential Roost Features (PRFs) and potential bat ingress / egress points, and (ii) locate any evidence of bats such as live or dead specimens, droppings, urine splashes, fur-oil staining, feeding remains (e.g. moth wings) and/or squeaking noises. Equipment used included ladders, high-powered torches and close-focusing binoculars, as appropriate. The external and internal inspection of the on-site structures was carried out by Natural England-licensed bat worker Tom Clemence (Class Survey Licence WML CL18 – Registration number: 2017-28795-CLS-CLS) on 16 October 2019.

Limitations

There were no limitations.

Trees – Ground level Assessment

A detailed inspection of all trees at the Site was undertaken from ground level to (i) identify PRFs such as rot holes, cavities and split limbs, and (ii) locate any evidence of bats such as live or dead specimens, bat droppings, urine splashes, fur-oil staining, feeding remains (e.g. moth wings) and/or squeaking noises. The inspections were carried out systematically around all parts of the

tree, from all angles and from both close to the trunk and further away. Equipment used included a ladder, endoscope, high-powered torches and close-focusing binoculars, as appropriate. The ground level roost assessment was undertaken by Natural England-licensed bat worker Tom Clemence ACIEEM (Class Survey Licence WML-CL18– Registration number: 2017-28795-CLS-CLS) on 16 October 2019.

Limitations

Some potential roosting features were not possible to reach using ladders or endoscope. Trees were categorised accordingly with further surveys recommended where required to assess these features.

Evaluation

Following the assessments, each tree was assigned one of the following categories in respect of its potential to support roosting bats (adapted from Collins, 2016):

- *Negligible*: Negligible habitat features on site likely to be used by roosting bats

- *Low*: a structure with one or more potential roost sites (PRSs) that could be used by individual bats opportunistically. However, these potential roost sites do not provide enough space, shelter, protection, appropriate conditions and/or suitable surrounding habitat to be used on a regular basis by large numbers of bats. A tree of sufficient size and age to contain potential roost features (PRFs) but with none seen from the ground or features seen with only very limited roosting potential.

- *Moderate* – a structure or tree with one or more PRSs that could be used by bats due to their size, shelter, protection, conditions and surrounding habitat; but unlikely to support a roost of high conservation status.

- *High* – a structure or tree with one or more PRSs that are obviously suitable for use by larger numbers of bats on a more regular basis and potentially for longer periods of time due to their size, shelter, protection, conditions and surrounding habitat.

<u>Remote Monitoring Surveys</u>

Remote monitoring will be undertaken in order to provide additional data to inform the assessment of bat activity across the Site. The extended time period covered by this type of survey allows for a more accurate assessment of bat species diversity and relative activity levels.

Wildlife Acoustics SM4 detectors will used on-site over three occasions during the bat active period and left to record automatically for the hours between half an hour before sunset and half an hour after sunrise, for several

consecutive days. Bat call data, from the five nights during which weather conditions were most suitable for bats to be active, will be analysed using the latest Analook software to identify the species present.

Limitations

Surveys are yet to be carried out.

Results

Preliminary Roost Assessment

Structures

Two buildings were identified within the Site, B1 and B2. B1 comprises a single storey structure of timber frame construction, using butt joints, with single skin corrugated metal sheet walls and single pitched roof. The structure is open on its western elevation creating an exposed and light internal environment. No potential roost features were identified within the building. Given its construction type and exposure levels B1 is assessed as providing negligible potential to support roosting bats.

B2 comprises a small, single storey brick built structure, possibly once used as a timber/coal store or outside toilet. The roof is single pitch, covered by a single skin of corrugated cement bonded sheeting. No evidence of bats or potential roost features were recorded. B2 is assessed as providing negligible potential to support roosting bats.

Trees

Of the trees on-site all but one were assessed as providing negligible potential to support roosting bats. The on-site lombardy-poplar, T70 on the Tree Constraints Plan and Target Note 7 on the Habitats Plan, has five woodpecker holes which have led to additional rot within the main trunk of the tree. These features provide moderate roosting potential for bats. No evidence of bats making use of the tree was recorded at the time of survey. However, a detailed inspection of each hole was not possible due to the height of the features.

An aerial inspection or two emergence/re-entry surveys are recommended prior to the felling of this tree to confirm the likely absence or presence of roosting bats. In the event roosting bats are confirmed a mitigation licence from Natural England will likely be required to allow for the lawful disturbance or destruction of a bat roost.

Appendix G

Badger Survey

Legislation

Badgers and their setts are protected under the Protection of Badgers Act 1992 therefore a Natural England licensing system exists to permit certain works that would otherwise be illegal. Works that require a license include direct impacts to badger entrances and certain works within close proximity to a badger sett that may disturb badgers.

Methods

A dedicated badger survey was conducted on the 16 October 2019 by Tom Clemence ACIEEM using standard survey methods, searching the Site and immediately adjacent areas for field signs of badger and mapping any present such as:

- Feeding signs such as snuffle entrances made during foraging.
- Hairs caught on vegetation or fences.
- Latrines, usually positioned on territorial boundaries.
- Foraging tracks through vegetation or under fences.
- Badger setts.

When badger setts are found the number of entrances are recorded as well as the level of usage. Recording this information gives an indication of the type of sett by categorising it according to the criteria listed in the Table below (Harris *et al*. 1989, Cresswell *et al*. 1990, Wilson *et al*. 1997).

Table G.1. Criteria used to determine sett type.

Sett Type
Main Setts - These usually have a large number of entrances with large spoil heaps, and the sett generally looks well used. There will be well-used paths to and from the sett and between sett entrances. Although normally the breeding sett is in continuous use, it is possible to find a main sett that has become disused due to excessive digging or some other reason; it should be recorded as a disused main sett. In the first survey, the average size of an active main sett was twelve entrances (including all categories of use).
Annexe setts - They are often close to a main sett, usually less than 150 metres away, and are usually connected to the main sett by one or more obvious well-worn paths. They usually have several entrances, but may not be in use all the time even if the main sett is very active. In the first survey the average size was five entrances (including all categories of use).
Subsidiary setts - These often only have a few; four (including all categories of use) was the average number in the first survey. They are usually at least 50 metres from a main sett, and do not have an obvious path connecting with another sett. They are not continuously active.
Outlying setts - These usually have only one or two entrances, often have little spoil outside the entrance, have no obvious path connecting with another sett, and are only used sporadically. When not in use by badgers, they are often taken over by foxes or even rabbits. However, they can still be recognised as badger setts by the shape of the tunnel (not the actual entrance entrance), which is usually at least 250mm in diameter, and is rounded or a flattened oval shape. Fox and rabbit tunnels are smaller and often taller than broad.
Entrance Type
Well used entrances - These are clear of any debris or vegetation, are obviously in regular use, and may or may not have been excavated recently.
Partially used entrances - These are not in regular use and have debris such as leaves and twigs in the entrance, or have moss and/or other plants growing in or around the entrance. Partially used entrances could be in regular use after a minimal amount of clearance.

Disused entrances - These have not been in use for some time, are partially or completely blocked, and could not be used without a considerable amount of clearance. If the entrance has been disused for some time, all that may be visible is a depression in the ground where the entrance used to be, and the remains of the spoil heap, which may be covered in moss or plants.

Limitations

The survey was limited to the habitats on-site and those visible from the Site boundaries.

Results

No badger setts were recorded within the Site during the survey. However, three fresh badger latrines were recorded within the Site on the north-eastern boundary, adjacent to the eastern edge of the on-site woodland. In addition a badger print was recorded in this location.

Badger setts are taken as likely absent from the Study Area. However, badgers are confirmed as making use of the Site for foraging and dispersal. With this in mind, the following safeguards are recommended:

- Cover any open excavations with wooden boards, or fit them with appropriate escape ramps, in order to prevent badgers falling into them and injuring themselves or becoming trapped.
- Cap or block any pipework over 150mm in diameter which is to be left overnight.

Appendix H

Great Crested Newt Habitat Suitability Index

Legislation

Great crested newts are legally protected as European Protected Species (EPS) under Regulation 43 of the Conservation of Habitats and Species Regulations 2017. These Regulations make it an offence to:

- Deliberately capture, injure, kill or capture a great crested newt
- Deliberately disturb great crested newts, impairing their ability to survive, breed, reproduce or rear/nurture their young
- Damage or destroy a breeding site or resting place used by a great crested newt

Great crested newts are also fully protected under the Wildlife & Countryside Act 1981, making it an offence to:

- Intentionally or recklessly disturb a great crested newt while it is occupying a structure or place of shelter or protection
- Intentionally or recklessly obstruct access to any structure or place of shelter or protection

Disturbance of great crested newts is covered by both the 2017 Regulations and the 1981 Act. Disturbance that impairs survival or successful reproduction would be covered by the Regulations, while less significant acts of disturbance may only be covered by the Act.

It is important to note that great crested newts and their habitats (such as breeding ponds) are protected throughout the year, regardless of whether or not newts are present at the time.

Great crested newts are also listed as a species of principal importance for the conservation of biodiversity in England, under Section 41 (S41) of the Natural Environment and Rural Communities (NERC) Act 2006. The S41 species list is used to guide decision-makers, including planning authorities, in implementing their duty under Section 40 of the NERC Act to have regard to the conservation of biodiversity in England, when carrying out their normal functions.

<u>Licensing</u>

Where development is proposed that would result in an offence under the Habitats and Species Regulations, a statutory derogation licence may be granted by Natural England to permit an act that would otherwise be unlawful. To obtain an EPS licence for development, it must be demonstrated that the purpose of the act to be licensed is for:

- *"preserving public health or public safety or other imperative reasons of overriding public interest including those of social or economic nature and*

beneficial consequences of primary importance for the environment" (Regulation 55(2)(e))

In addition, Natural England will not grant an EPS licence unless they are satisfied that:

- *"There is no satisfactory alternative" (Regulation 55(9)(a))*
- *"The action authorised will not be detrimental to the maintenance of the population of the species concerned at a favourable conservation status in their natural range" (Regulation 55(9)(b))*

Methods

Desktop Study

In accordance with Natural England's Great Crested Newt Mitigation Guidelines (2001), a desktop search was undertaken to identify ponds within 500m of the Site which may have potential to support breeding great crested newts *Triturus cristatus*, using Ordnance Survey (OS) mapping, the MAGIC database and aerial photography. 500m is the generally accepted typical maximum dispersal range of this species, with great crested newt most likely to use terrestrial habitat within 250m of breeding ponds.

A total of six ponds were identified within a 500m range of the Site.

Limitations

There were no limitations to the desktop study.

Habitat Suitability Index (HSI) Assessment

Where ponds were situated within an 500m of the Site and access was possible a Habitat Suitability Index (HSI) assessment, using the standard approach set out by Oldham et al (2000), was carried out on 16 October 2019. These assessments were undertaken by Tom Clemence (Class Survey Licence CL08 – Registration number: 2016-25544-CLS-CLS).

Limitations

Public access was not possible to four of the six ponds identified and hence HSI assessments on 16 October 2019 were not possible. However, in 2018 GCN were confirmed as present within two of these ponds during the desktop study (P3 and P6).

Results

Desktop Study

The desk based search for ponds and subsequent site visits confirmed the presence of six ponds within 500m of the Site. Of these ponds two (P3 and P6) were confirmed as being used by GCN in 2018.

P3 is located c. 340m west of the Site. The pond is separated from the Site by Station Road and c. 180m of residential housing with associated areas of hardstanding and garden.

P6 is located c. 350m south of the Site within an area of woodland. This pond is separated from the Site by a combination of arable land, two roads (A603 and Barford Road) and a car park associated with Frosts Garden Centre.

Habitat Suitability Index (HSI) Assessment

HSI assessment was limited to P2 and P5. Results of the HSI assessments are provided within the tables below. By way of summary P2 is assessed as having a 'below average' and P5 a 'poor' suitability to support GCN.

Site	**4439 Barford Road, Willington**
Pond number	**Pond 2**

Habitat Suitability Index

					SI value
SI1.	Map location	A/B/C		A	1.00
SI2.	Surface area	rectangle/ellipse/irregular		ellipse	
			length (m)		
			width (m)		
			area (m²) =	240	0.48
SI3.	Dessication rate	never/rarely/sometimes/frequently		never	0.90
SI4.	Water quality	good/moderate/poor/bad		moderate	0.67
SI5.	Shade	% of margin shaded 1m from bank		40	1.00
SI6.	Waterfowl	absent/major/minor		minor	0.67
SI7.	Fish population	absent/possible/minor/major		major	0.01
SI8.	Pond density	number of ponds within 1km		6	0.82
SI9.	Terrestrial habitat	good/moderate/poor/isolated		moderate	0.67
SI10.	Macrophyte cover	%		80	1.00

HSI=	**0.50**
Pond Suitability*	**Below average**
HSI assessment date	16/10/2019

**Following the Lee Brady system*

Photo/sketch

Site	**4439 Barford Road, Willington**
Pond number	**Pond 5**

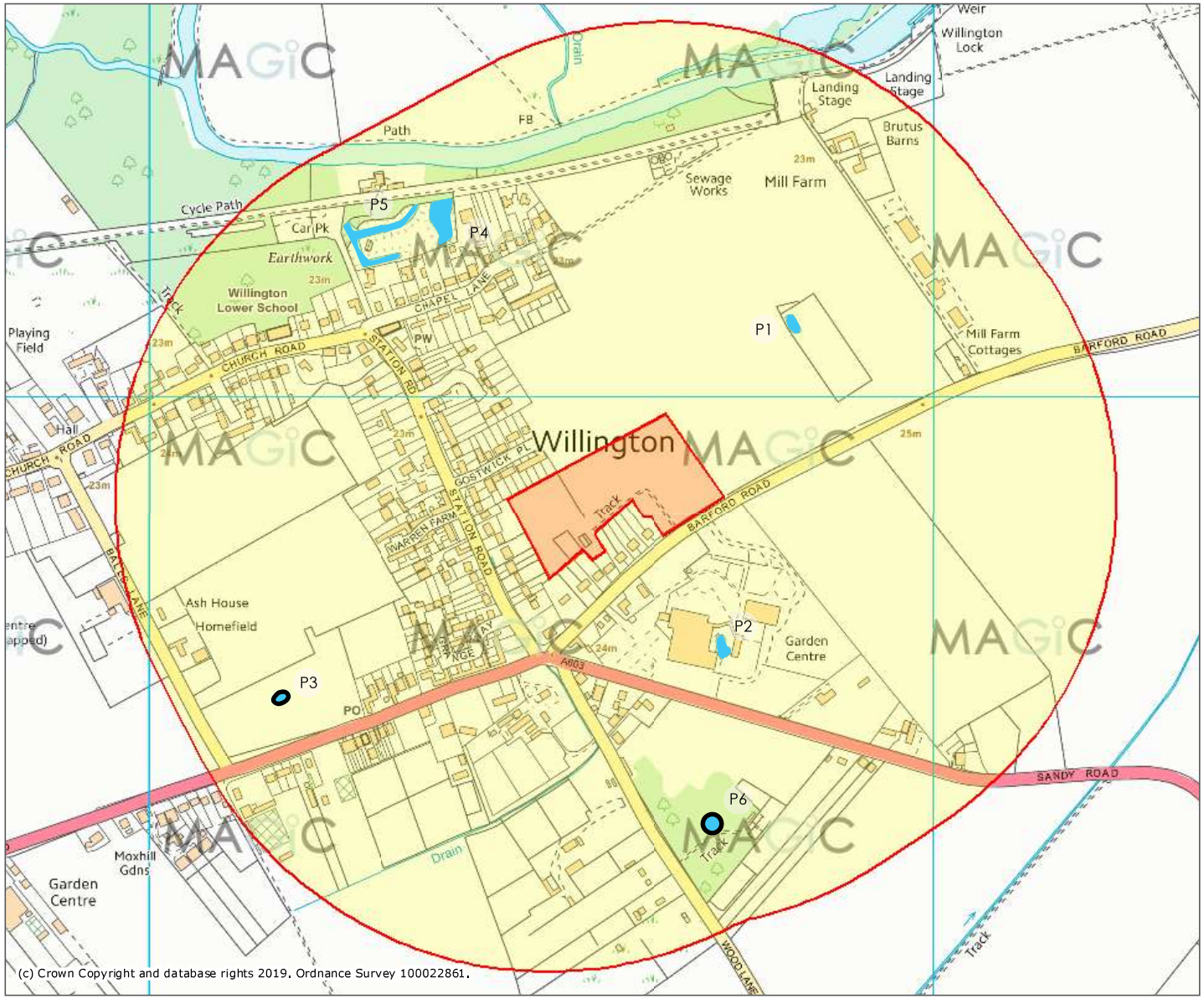
Habitat Suitability Index

				SI value
SI1.	Map location	A/B/C	A	1.00
SI2.	Surface area	rectangle/ellipse/irregular	irregular	
		OR estimate (m2) if irregular		
		area (m¯) =	1999	0.79
SI3.	Dessication rate	never/rarely/sometimes/frequently	rarely	1.00
SI4.	Water quality	good/moderate/poor/bad	moderate	0.67
SI5.	Shade	% of margin shaded 1m from bank	50	1.00
SI6.	Waterfowl	absent/major/minor	major	0.01
SI7.	Fish population	absent/possible/minor/major	possible	0.67
SI8.	Pond density	number of ponds within 1km	6	0.82
SI9.	Terrestrial habitat	good/moderate/poor/isolated	moderate	0.67
SI10.	Macrophyte cover	%		0.31

HSI=	**0.48**
Pond Suitability*	**Poor**
HSI assessment date	16/10/2019

**Following the Lee Brady system*

Photo/sketch



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Project	Barford Road, Willington, Bedfordshire	Date Nov' 2019	Drawing No. CSA/4439/101
Drawing Title	Ponds Plan	Scale NTS	Rev -
Client	[redacted]	Drawn TC	Checked JW

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Appendix 3 – Archaeological and Heritage Assessment

Land North of Barford Road, Willington, Bedfordshire

Archaeological and Heritage Assessment

Prepared by:
The Environmental Dimension Partnership Ltd

On behalf of:
Clarendon Land and Development,
Mr P Phipp, Mr S Hesford and Mrs Z Hesford

November 2019
Report Reference
edp5721_r001a

Contents

Images

Appendix

Plans

This version is intended for electronic viewing only

	Report Ref: edp5721_r001			
	Author	**Formatted**	**Peer Review**	**Proofed by/Date**
001_DRAFT	LB	CRC	EO	-
001	LB	-	EO	CR 131119

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Non-technical Summary

S1 This Archaeological and Heritage assessment has been prepared by the Environmental Dimension Partnership Ltd (EDP), on behalf of Clarendon Land and Development, Mr P Phipp, Mr S Hesford and Mrs Z Hesford to inform planning proposals for a residential development on Land North of Barford Road, Willington, Bedfordshire.

S2 The report has confirmed that the application site does not contain any designated heritage assets such as world heritage sites, scheduled monuments, registered parks and gardens, registered battlefields or listed buildings, where there would be a presumption in favour of their physical preservation *in situ* and preclude development within the site.

S3 The historic and modern settings of each of the designated assets within the application site's wider study area have been assessed, and it is determined that the significance of the surrounding designated assets would in no way be adversely affected by the form of development proposed within the site, either in terms of an effect on their physical form/fabric or through change to the contribution made by their setting.

S4 It is considered that whilst there is a historic link between the site and the Grade II listed The Timbers to the south, the degree of separation due to modern development and mature vegetation screening between The Timbers and the site, along with the change in use of the land, the site no longer forms any part of the setting of this asset.

S5 During the site visit it was observed that glimpsed views of the Grade II listed Clumbercote were visible from within the site. As such whilst the site is considered to form part of the setting of the asset, in terms of how the asset is appreciated, there is no reason to suggest that the site makes any contribution to its significance. There is potential for the introduction of glimpsed built form into the backdrop of the asset when viewed from the road. However, such change is not considered to constitute harm to the asset or the appreciation of the significance of the asset.

S6 No evidence of prehistoric or Roman activity was recorded within the site. Geophysical survey within the site recorded a potential semi-circle feature within the western parcel of the site, though the date and origin of this is uncertain. The site is located on the edge of the projected medieval settlement of Willington, though there is no suggestion that the site was anything other than agricultural land during this period. The geophysical survey recorded evidence of ridge and furrow within the site, suggestive of post-medieval or later agricultural practices.

S7 During the 20th century the site was in use as a plant nursery. Within the site there are partially extant remains of the buildings associated with the former nursery, and further remains were also partially recorded on the geophysical survey.

S8 There is no reason to believe or expect that the site will contain archaeology of such significance that it would require preservation *in situ*. If any below-ground deposits are

present, they are likely to be poorly preserved due to modern agricultural activity, thereby reducing their significance.

S9 It is considered that the current level of assessment, including the findings of the geophysical survey, is adequate to inform a planning application for development within the site, and that the proposed development accords with current legislation, the planning policies contained within the National Planning Policy Framework (NPPF) and the policies of the Local Plan.

Section 1
Introduction

1.1 This Archaeological and Heritage assessment has been prepared by the Environmental Dimension Partnership Ltd (EDP), on behalf of Clarendon Land and Development, Mr P Phipp, Mr S Hesford and Mrs Z Hesford, to inform an outline planning application for up to 33 dwellings, new planting and landscaping, vehicular access point from Barford Road and associated ancillary works at Land North of Barford Road, Willington. All matters reserved with the exception of the main vehicular access.

1.2 The first aim of this assessment is to consider the available historical and archaeological resources for the application site and to establish its likely potential in accordance with the requirements of the National Planning Policy Framework (NPPF, DCLG, 2019) and local planning policy.

1.3 In accordance good practice and guidance, desktop sources have been augmented through the completion of a walkover survey, which in this case was undertaken in July 2019. Following this a geophysical survey was undertaken in September 2019.

1.4 The second aim of this assessment is to identify and assess possible changes to the setting of surrounding designated heritage assets as a result of the proposed development, and to determine whether, and to what extent, those changes will affect their heritage significance.

Location, Boundaries, Topography and Geology

1.5 The site is located on the eastern edge of the settlement of Willington. The site measures c.2 hectares (ha) in area and is centred on National Grid Reference (NGR) 511537 249876 (**Plan EDP 1**).

1.6 The site boundaries comprise residential garden edges to the west, north-west and south. To the north and east the site opens into a larger field with no defined boundary.

1.7 The land reaches a height of approximately 24m above Ordnance Datum (aOD) and is generally flat.

1.8 The British Geological Survey records the underlying solid geology at the site as being Peterborough Member mudstone. Superficial deposits are recorded across the site as being river terrace deposits of sand and gravel (BGS 2019). The River Great Ouse runs east to west c.390m north of the site at its closest extent.

Current Land Use

1.9 The site comprises grassland with groups of trees in the west of the site and agricultural land in the east. A footpath leads from Barford Road to the south, leading north-west then curving to the west into the grassland area in the west.

Proposed Development

1.10 The proposed development comprises up to 33 dwellings with associated landscaping, access, services and utilities.

Section 2
Legislation and Planning Guidance

2.1 This section sets out existing legislation and planning policy, governing the conservation and management of the historic environment, of relevance to this application.

Current Legislation

2.2 Section 66(1) of the Planning (Listed Buildings and Conservation Areas) Act 1990 sets out the duties of Local Planning Authorities in respect of the treatment of listed buildings through the planning process. It sets out the statutory duty of the decision-maker, where proposed development would affect a listed building or its setting, stating:

"In considering whether to grant planning permission [or permission in principle] for development which affects a listed building or its setting, the local planning authority or, as the case may be, the Secretary of State shall have special regard to the desirability of preserving the building or its setting or any features of special architectural or historic interest which it possesses."

2.3 The "*special regard"* duty of the 1990 Act has been tested in the Courts and confirmed to require that "*considerable importance and weight*" is afforded by the decision maker to the desirability of preserving a listed building along with its setting.

2.4 Paragraph 194 of NPPF (see MHCLG 2019) transposes s66(1) of the 1990 Act into national planning policy.

2.5 The balancing exercise to be performed – between the harm arising from a proposal and the benefits which would accrue from its implementation – is then subsequently presented in paragraphs 195 and 196 of the NPPF.

National Planning Policy

2.6 The revised NPPF was published in July 2018, and further revised in June 2019. Section 16 of the NPPF sets out the government's approach to the conservation and management of the historic environment, including both listed buildings and conservation areas, through the planning process. The opening paragraph, 184 recognises that heritage assets are an irreplaceable resource, and should be conserved in a manner appropriate to their significance, so that they can be enjoyed for their contribution to the quality of life of existing and future generations.

2.7 Paragraph 189 concerns planning applications, stating that:

"In determining applications, local planning authorities should require an applicant to describe the significance of any heritage assets affected, including any contribution made

by their setting. The level of detail should be proportionate to the assets' importance and no more than is sufficient to understand the potential impact of the proposal on their significance. As a minimum the relevant historic environment record should have been consulted and the heritage assets assessed using appropriate expertise where necessary. Where a site on which development is proposed includes, or has the potential to include, heritage assets with archaeological interest, local planning authorities should require developers to submit an appropriate desk-based assessment and, where necessary, a field evaluation."

2.8 Paragraph 193 considers the weighting given within the planning decision with regard to impacts on designated heritage assets, stating that:

"When considering the impact of a proposed development on the significance of a designated heritage asset, great weight should be given to the asset's conservation (and the more important the asset, the greater the weight should be). This is irrespective of whether any potential harm amounts to substantial harm, total loss or less than substantial harm to its significance."

2.9 Paragraph 194 considers the level of harmful effects on designated heritage assets and states that:

"Any harm to, or loss of, the significance of a designated heritage asset (from its alteration or destruction, or from development within its setting), should require clear and convincing justification. Substantial harm to or loss of:

a. Grade II listed buildings, or grade II registered parks or gardens, should be exceptional; and

b. Assets of the highest significance, notably scheduled monuments, protected wreck sites, registered battlefields, grade I and II listed buildings, grade I and II* registered parks and gardens, and World Heritage Sites, should be wholly exceptional."*

2.10 With regard to the decision-making process, paragraphs 195 and 196 are of relevance. Paragraph 195 states that:

"Where a proposed development will lead to substantial harm to (or total loss of significance of) a designated heritage asset, local planning authorities should refuse consent, unless it can be demonstrated that the substantial harm or total loss is necessary to achieve substantial public benefits that outweigh that harm or loss, or all of the following apply:

a. The nature of the heritage asset prevents all reasonable uses of the site;

b. No viable use of the heritage asset itself can be found in the medium term through appropriate marketing that will enable its conservation;

c. *Conservation by grant-funding or some form of not for profit, charitable or public ownership is demonstrably not possible; and*

d. *The harm or loss is outweighed by the benefit of bringing the site back into use."*

2.11 Paragraph 196 states that:

"Where a development proposal will lead to less than substantial harm to the significance of a designated heritage asset, this harm should be weighed against the public benefits of the proposal including, where appropriate, securing its optimum viable use."

2.12 The threshold between substantial and less than substantial harm has been clarified in the courts. Whilst the judgement relates specifically to the impact of development proposals on a listed building, paragraphs 24 and 25 of *Bedford BC v Secretary of State for Communities and Local Government [2013] EWHC 2847* remain of relevance here in the way they outline the assessment of 'harm' for heritage assets:

"What the inspector was saying was that for harm to be substantial, the impact on significance was required to be serious such that very much, if not all, of the significance was drained away.

Plainly in the context of physical harm, this would apply in the case of demolition or destruction, being a case of total loss. It would also apply to a case of serious damage to the structure of the building. In the context of non-physical or indirect harm, the yardstick was effectively the same. One was looking for an impact which would have such a serious impact on the significance of the asset that its significance was either vitiated altogether [i.e. destroyed] or very much reduced."

2.13 In other words, for the 'harm' to be 'substantial' – and therefore require consideration against the more stringent requirements of paragraph 195 of the NPPF compared with paragraph 196; the proposal would need to result in the asset's significance either being *"vitiated altogether or very much reduced"*. Quite evidently, this represents a very high threshold to be reached.

2.14 With regard to non-designated heritage assets, paragraph 197 states that:

"The effect of an application on the significance of a non-designated heritage asset should be taken into account in determining the application. In weighing applications that directly or indirectly affect non-designated heritage assets, a balanced judgement will be required having regard to the scale of any harm or loss and the significance of the heritage asset."

Local Planning Policy

Bedford Borough Council Local Plan 2002

2.15 The Bedford Borough Local Plan 2002 was the main planning policy document before the 2008 Core Strategy and Rural Issues Plan was adopted. Bedford Bourgh Council is preparing an updated Local Plan, which has finished consultation and awaiting adoption. The saved policies within the current Local Plan (2002) are as follows.

2.16 With regard to the setting of listed building Policy BE 21 outlines:

"The Borough Council will seek to preserve and enhance the setting of listed buildings by appropriate control over the design of new development in their vicinity, over the use of adjacent land, and where appropriate, by the preservation of trees and landscape features."

2.17 Policies BE 23, BE 24 and BE 25 focus on ancient monuments and archaeology:

Policy BE23

"Proposals which would have an adverse effect on scheduled ancient monuments and other important archaeological sites and monuments, and their settings, will not be permitted except in circumstances where the adverse impact of a proposal can be overcome and the site or monument physically preserved in situ."

Policy BE24

"In considering planning proposals, the Borough Council will have regard to the need to protect, enhance and preserve sites of archaeological interest and their settings. It will where appropriate require the archaeological aspects of development proposals to be examined and evaluated before a planning application is determined. In the absence of an adequate assessment of the archaeological implications, planning permission will be refused."

Policy BE25

"Where the Borough Council decides that the physical preservation in situ of archaeological remains is not justified, and that development affecting such remains should proceed, it will require applicants to submit proposals that:

i) minimise as far as possible the effect of a proposal on the archaeological remains; and

ii) ensure satisfactory provision for the excavation and recording of the remains, prior to the commencement of development."

Core Strategy and Rural Issues Plan 2008

2.18 The Core Strategy and Rural Issues Plan Development Plan Document sets out the long-term spatial vision for Bedford Borough to 2021. It was adopted by the Council on the 16 April 2008.

2.19 Policy CP23 focuses on heritage stating:

"Development will be required to protect and where appropriate enhance:

i) the character of conservation areas, scheduled ancient monuments, historic parks and gardens, listed buildings and other important historic or archaeological features; and,

ii) the borough's cultural assets, including its landscape, in order to underpin sense of place, cultural identity and promote quality of life."

2.20 Policy CP21 – Designing in Quality, deals with how heritage assets can influence design:

"All new development should:

i) be of the highest design quality in terms of both architecture and landscape; and,

ii) have regard to good practice in urban design; and,

iii) fully consider the context within which it will sit and the opportunities to enhance the character and quality of an area and local distinctiveness; and,

iv) preserve and, where appropriate, enhance conservation areas, scheduled ancient monuments and other important archaeological remains, and listed buildings and their settings; and,

v) be fully accessible by all members of the community; and,

vi) incorporate measures to promote crime prevention and community safety; and,

vii) address sustainable design principles including renewable energy resources, energy efficiency, recycling, and sustainable construction practices and

- *mitigate against the effects of any pollution including air quality, noise, water, light and land contamination;*
- *improve the character and quality of the area."*

2.21 The plans and policies listed above have all been considered in the preparation of this assessment.

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Section 3
Methodology

Archaeological Assessment Methodology

3.1 This report has been produced in accordance with the *Standard and Guidance for Historic Environment Desk-Based Assessment* issued by the Chartered Institute for Archaeologists (CIfA, 2017). These guidelines provide a national standard for the completion of desk-based assessments.

3.2 This report provides a synthesis of relevant information for the site derived from a search area extending up to 1km from its boundary, hereafter known as the 'study area', to allow for additional contextual information regarding its archaeological interest or potential to be gathered.

3.3 The assessment principally involved consultation of readily available archaeological and historical information from documentary and cartographic sources. The major repositories of information comprised:

- Information held by the Bedford Historic Environment Record (HER) on known archaeological sites, monuments and findspots, within approximately 1km of the site;
- Maps and documents held by the Bedfordshire Archives and freely available online resources;
- The National Heritage List for England curated by Historic England;
- Aerial photographs held by the Historic England Archive (HEA); and
- Records made during a site visit in July 2019.

3.4 As part of this assessment a geophysical survey was undertaken, in consultation with Bedford Borough Council's archaeological advisor, within the site in September 2019, the results of which are included in this report and provided at **Appendix EDP 1.**

3.5 The information gathered from the repositories and sources identified above was checked and augmented through the completion of a site visit and walkover. This walkover considered the nature and significance of known and/or potential archaeological assets within the site, identified visible historic features and assessed possible factors which may affect the survival or condition of known or potential assets.

Setting Assessment Methodology

3.6 In addition, the report also considers the nature and significance of any effects arising beyond the boundary of the application site, i.e. through potential changes to the settings of designated heritage assets, as defined in Annex 2 of the NPPF (see below).

3.7 The assessment process has given due consideration to Historic England guidance on setting as set out in *Historic Environment Good Practice Advice in Planning, Note 3, The Setting of Heritage Assets* (HE 2017).

3.8 Setting is defined as "*the surroundings in which a heritage asset is experienced*". It must be recognised from the outset that 'setting' is not a heritage asset and cannot itself be harmed. Its importance relates to the contribution it makes to the significance of the designated heritage asset.

3.9 In that regard, 'significance' is defined in Annex 2 of the NPPF as "*the value of a heritage asset to this and future generations because of its heritage interest. That interest may be archaeological, architectural, artistic or historic.*"

3.10 As such, when assessing the indirect impact of proposals on designated heritage assets, it is not a question of whether setting would be affected, but rather a question of whether change within an asset's 'setting' would lead to a loss of 'significance' based on the above 'heritage interest' as defined in the NPPF. The guidance identifies that change within a heritage asset's setting need not necessarily cause harm to that asset – it can be positive, negative or neutral.

3.11 In light of the above, the assessment of potential setting effects, arising from the proposed scheme, has followed the guidance set out in *Historic Environment Good Practice Advice in Planning Note 3: The Setting of Heritage Assets* published by Historic England in 2017. This guidance (HE 2017) observes that: *"The NPPF makes it clear that the extent of the setting of a heritage asset is not fixed and may change as the asset and its surroundings evolve."*

3.12 And that: "*Elements of a setting may make a positive or negative contribution to the significance of an asset, may affect the ability to appreciate the significance or may be neutral.*"

3.13 The guidance states that the importance of setting "*lies in what it contributes to the significance of the heritage asset or to the ability to appreciate that significance.*"

3.14 It goes on to note:

"All heritage assets have significance, some of which have particular significance and are designated. The contribution made by their setting to their significance also varies. Although many settings may be enhanced by development, not all settings have the same capacity to accommodate change without harm to the significance of the heritage asset or the ability to appreciate it."

3.15 Whilst identifying that elements of an asset's setting can make an important contribution to its significance, the guidance states that: "*Setting is not itself a heritage asset, nor a heritage designation, although land comprising a setting may itself be designated*". It continues by adding that: "*Conserving or enhancing heritage assets by taking their settings into account need not prevent change; indeed change may be positive…*".

3.16 On a practical level, the Historic England guidance (2017) identifies an approach to assessing setting in relation to development management which is based on a five-step procedure, i.e.:

1. Identify which heritage assets and their settings are affected;

2. Assess the degree to which these settings and views make a contribution to the significance of the heritage asset(s) or allow significance to be appreciated;

3. Assess the effects of the proposed development, whether beneficial or harmful, on the significance or on the ability to appreciate it;

4. Explore ways to maximise enhancement and avoid or minimise harm; and

5. Make and document the decision and monitor outcomes.

3.17 As far as Step 2 is concerned, the guidance makes the following observations:

"The second stage of any analysis is to assess whether the setting of a heritage asset makes a contribution to its significance and the extent and/or nature of that contribution…this assessment should first address the key attributes of the heritage asset itself and then consider:

- *The physical surroundings of the asset, including its relationship with other heritage assets;*

- *The asset's intangible associations with its surroundings, and patterns of use*

- *The contribution made by noises, smells, etc to significance, and*

- *The way views allow the significance of the asset to be appreciated"*

3.18 Thereafter, the guidance notes that *"This assessment of the contribution to significance made by setting will provide the baseline for establishing the effects of a proposed development on significance, as set out in 'Step 3' below"*.

3.19 Having established the baseline, the following guidance is provided in respect of an assessment of the effect upon 'setting', i.e.:

"In general…the assessment should address the attributes of the proposed development in terms of its:

- *Location and siting;*
- *Form and appearance;*
- *Wider effects; and*
- *Permanence."*

3.20 In light of the above, the assessment of potential setting effects, employed in the preparation of this report, focused on the completion of site surveys, which were undertaken in July 2019 and concentrated on the following three main areas:

1. Identifying those heritage assets that could potentially be affected by the proposed scheme and the manner (if any) in which they would be affected;
2. Defining the contribution made to their *significance* by their setting; and
3. Assessing the likely impact upon their *significance* as a result of the form of development proposed being implemented.

3.21 As far as identifying the heritage assets potentially affected by the proposed scheme is concerned, this was determined in the first instance through desk-assessment; then verified during the subsequent field visits.

3.22 In light of the above, the heritage setting assessment at **Section 5** of this report has been prepared in a robust manner, employing current best practice professional guidance and giving due regard to the methodology detailed above.

3.23 The report concludes with an assessment of the site's likely archaeological potential, made with regard to current best practice guidelines, and an assessment of the likely effects of the proposed development upon designated assets, whether direct or indirect.

Section 4
Existing Information

Introduction

4.1 The site does not contain any scheduled monuments, listed buildings, registered parks and gardens, registered battlefields or world heritage sites where there would be a presumption in favour of preservation *in situ* or would potentially constrain development within the site.

4.2 There are seven scheduled monuments and 20 Listed Buildings within the defined search area. These consist of 2 Grade I and 18 Grade II Listed Buildings, the locations of which are shown on **Plan EDP 1**.

4.3 Bedford Borough Council has not compiled a list of Locally Listed Buildings.

4.4 Within the study area the Bedford HER returned 87 monument records. These records were refined in order to narrow the research focus to those of relevance to the present assessment. As such not all HER records are therefore referred to, discussed or illustrated within the body of this report. Those discussed are shown on **Plan EDP 2**.

Designated Heritage Assets

4.5 There are 7 Scheduled Monuments and 20 Listed Buildings, and no registered parks and gardens, registered battlefields or world heritage sites within the defined search area. Those subject to detailed assessment are considered in relation to the potential of the site in relation to their setting and contribution to significance are discussed in **Section 5**.

Scheduled Monuments

4.6 There are no scheduled monuments within the site. Within the wider area there are seven recorded scheduled monuments (see **Plan EDP 1**). These comprise:

- Hengi-form monument 480m south of Dairy Farm (**1015586**) c.910m north of the site;
- Henge type monument and bowl barrow 500m south-east of Dairy Farm (**1015587**) c.850m north of the site;
- Two bowl barrows 330m south of Dairy Farm (**1015589**) c.1km north of the site;
- Bowl Barrow 550m south-east of Dairy Farm (**1015590**) c.830m north of the site;
- 'The Docks' moated site and dock, Willington (**1012079**) c.320m north of the site;

- Willington Stables (**1004502**) c.855m west of the site; and

- Willington Dovecote (**1004503**) c.813m west of the site.

4.7 The hengi-form monuments (**1015586**, **1015587**) and barrows (**1015589**, **1015590**) are grouped c.830m–1km to the north of the site. These are located on the low lying gravel terrace on the northern side of the Gadsey Brook, a tributary of the Great Ouse River which flows into the main river some 400m further east. The barrows have been reduced by ploughing, and the earthwork remains are now barely perceptible on the ground though can be observed as crop marks. The significance of these assets is derived primarily from the high archaeological interest of their buried remains, along with their group value.

4.8 While they are now ostensibly experienced as components of a modern farmed and settled landscape, their setting still makes a limited contribution to their significance, principally through their placement on the river terraces, from where they form a loose group and it is possible to appreciate their historic inter-relationships.

4.9 Within the wider area there are recorded cropmarks suggestive of further areas of activity (discussed below in the non-designated assets session), although none are scheduled, and there is no evidence that any such activity in the wider area was related to the scheduled monuments.

4.10 In relation to the site, the scheduled monuments lie some distance to the north, on the northern side of the River Ouse. With such spatial separation and the lack of any intervisibility, due to the natural topography, built form and intervening vegetation, or evidence for any historical relationships, means that there is not likely to be any association with the scheduled monuments which contributes to their significance. As such, the land within the site is not considered to make any contribution to the significance of these assets or the appreciation of the significance.

4.11 In each case it is considered that there is no potential for these scheduled monuments to experience any form of change to their significance as a result of the implementation of the proposed development within the site.

4.12 'The Docks' moated site and dock, Willington (**1012079**) is located c.310 north-west of the site. The listing citation states that: "*the monument includes the remains of a double island moated site and associated dock next to the River Great Ouse*". The embanked railway line and station are excluded from the scheduling, and the northern part of the site was destroyed by the railway, although the remains below the railway's low embankment are included. The significance of the asset is primarily drawn from the high archaeological and historical interest inherent in its buried and earthwork remains.

4.13 It was originally one of three interconnected medieval docks at the site. It survives as a rectangular waterfilled pond, measuring some 50m by 35m. The dock was originally connected to the River Great Ouse by a channel, which has since been backfilled. The date of construction of the dock is unknown, though recent excavations within the enclosures

uncovered the well-preserved remains of buildings dating to between the 11th and 14th centuries AD.

4.14 The setting of the monument is predominantly characterised by the river side placement and surrounding early medieval settlement which it would have served. During the modern period, housing was constructed to the south and east of the monument altering its setting. However, despite the surrounding development, the setting still makes a contribution to the heritage interest of the monument, principally through the appreciation of its placement alongside the river to the north.

4.15 The site, located c310m to the south, has no historic association with the designated monument, nor is there any intervisibility between the site and the designation, due to intervening topography, built form and vegetation. It is considered that the site forms no part of the setting of this asset, nor does it contribute to the significance, or appreciation of the asset. As such development within the site will not result in any adverse effects on the scheduled monument of 'The Docks' moated site and dock, Willington.

4.16 The scheduled monument of Willington Dovecote (**1004503**) (also a Grade I listed building **1321578**) is a 16th century dovecote located c.810m west of the site. The dovecote formed part of a 16th century manorial estate, built on the site of an earlier medieval manor house. Only the Grade II listed St Lawrence's Church (**1312387**), the Grade II listed Manor House (**1312403**) (now known as Manor Farmhouse), the Grade II listed garden wall at Manor Farm (**1114190**), the stables (discussed below) and the dovecote survive of this manorial estate built in the early 1540's by Sir John Gostwick. Sir John Gostwick was Master of the Horse to Cardinal Wolsey and later in service of Henry VIII as Treasurer and Receiver-General of the First Fruits and Tenths at the Dissolution. The dovecote is built from coursed limestone and ashlar dressing, possibly reused from Newnham priory, located 3.5km west of the dovecote, which was dissolved during the reformation. The dovecote and stables are now owned by the National Trust.

4.17 The significance of this building is its historic and architectural interest and is considered to be one of the largest well preserved examples of a sixteenth century dovecote. Alongside this, the dovecote's association with the 16th century manorial site and the links to Newnham priory, add to its significance.

4.18 Willington Stables (**1004502**) (also a Grade I listed building **1114191**) are located c.850m west of the site. As with the dovecote, the stables date to the mid 1540s and form part of the manorial complex built by Sir John Gostwick. The significance of this building derives from its historic and architectural interest, along its group value with the dovecote.

4.19 With regard to the setting of these assets, they form part of a 16th century manorial complex and are located close to St Lawrence's Church and Manor Farmhouse, at the western end of the settlement within large paddock areas, with undeveloped land to the north, west and south. Historic maps show several buildings within the manorial site, adjacent to the dovecote and stables. This grouping, and the visual association with the church and manor house would have been the main experience of the assets.

4.20 As mentioned above only the dovecote, stables, church and manor house survive of the former complex, with the manor house now in private ownership. Despite the loss of more than half of the former buildings the surviving buildings still form a recognisable group. This is primarily due to their proximity to one another and the lack of modern development infill around them, allowing for appreciation of their relationship with one another and their individual significance, although the manor house is visually screened by surrounding vegetation and is located c.150m west of the group, separating it slightly. It is this relationship and the placement within the undeveloped paddocks of land on the edge of the settlement which is considered to form the key experience of the asset and has a positive effect on the appreciation of their significance.

4.21 These assets are grouped towards the western end of the village and their wider setting, and indeed the intervening area with the site, is defined by extensive later 20th century settlement. As such, the site does not form part of the setting of these assets, nor does it contribute to the appreciation of the significance of these buildings either individually or as a group. As such, development of the site in the manner proposed is not considered to be able to impact upon their significance.

4.22 This position was verified during the course of the field surveys of the site and study area.

Listed Buildings

4.23 There are no listed buildings within the site. Within the wider area there are 20 recorded listed buildings. These comprise a mix of domestic buildings, farmhouses, a vicarage and the parish Church of St Lawrence, and are located within the historic core of the settlement.

4.24 Having visited these buildings and considered their historic background, it has been determined that the majority of these buildings will not be adversely affected by development within the site. The listed buildings are all located within the settlement of Willington, with their settings largely comprising their placement along the main roads within the settlement, the private garden areas and their relationship with the surrounding buildings. In this case, the character of the settlement is largely derived from later 20th century dwellings. These assets do not possess any historical association with the land within the site. Furthermore, the site is not experienced from or in combination with any of these assets due to their form and their topographic and geographic locations such that the site does not form part of their setting.

4.25 As such it is considered that there is no potential for the majority of these listed buildings to experience any form of change to their settings as a result development within the site, nor will it physically impact the assets. Therefore there is no potential for adverse effects on their significance, or the ability to appreciate that significance.

4.26 Nonetheless, following desk-based work and the site visit, it is considered that the following assets could *potentially* be affected by development within the site, through change to their setting, due to their relative proximity to the site:

- The Timbers (**1114187**), Grade II, located c.70m south of the site; and
- Clumbercote (**1114195**), Grade II, located c.40m west of the site.

4.27 As such these will be assessed further in **Section 5.**

Non-designated Heritage Assets

4.28 Within the study area the Bedford HER returned 87 monument records, and none within the site. The records provided by Bedford Borough Council were refined in order to narrow the research focus to those of relevance to the present assessment, these are shown on **Plan EDP 2.** As such not all HER records are therefore referred to, discussed or illustrated within the body of this report.

Palaeolithic–Iron Age (c.500,000 BC–AD 43)

4.29 There are no prehistoric period heritage assets recorded on the HER within the application site, although a large number of records have been recorded within the wider 1km study area. The Great Ouse valley is considered to be a focus for activity largely during the Bronze and Iron Ages, and this is reflected in the high number of features of this date recorded in the area, these are largely made up of cropmarks visible on aerial imagery and archaeological excavation mainly in advance of gravel extraction.

4.30 The closest recorded feature of this nature is recorded c.40m north-east of the site (**MBD985**). This comprises a triple linear boundary, identified on aerial imagery and mapped as part of the Bedford Borough National Mapping Programme (NMP), running north to south between the river and the main road through Willington. The central line is a continuous ditch, the eastern part of which is a ditch to the north and a pit alignment to the south, and the western part is a pit alignment. The boundary appears to have been truncated to the north by a disused railway line which cuts it off from the river, and to the south by the road. This has been interpreted as being Iron Age in date, and a trench was cut across it during the construction of the Huntingdon to Willington pipeline.

4.31 The lengthy nature of the feature, being a long boundary crossing a wider landscape, more than likely forms part of larger scale boundary division rather than closely relating to settlement. Indeed, the HER notes that it is likely to be a symbolic boundary enclosing and area between two watercourses. Its course was identified on historic aerial photographs (see below) as running to the east of the site and it, or any potentially associated features, was not identified within it.

4.32 A ring ditch is also visible to the south east of the boundary feature (**MBB22161**), c.220m east of the site. The ring ditch measures approximately 18m in diameter and was observed on modern aerial imagery and is also of possible Iron Age date, although untested archaeologically.

4.33 Located c.100 to the east of the site (**MBB22158**) is a further series of possible Iron Age boundary ditches, also observed on aerial imagery. Adjacent to this feature, c.260m east of the site (**MBB22159**) is a possible Bronze Age round barrow.

4.34 Located 100m to the south of the site at its closest extent the HER records an extensive area of prehistoric to Roman activity (**MDB1861**). This area encompasses a general area of cropmarks identified on aerial imagery, and during some limited geophysical survey and excavations. These observations identified features dating from the Neolithic period through to the Roman including a possible Neolithic cursus, ring ditch enclosures, multiple pits and linear features, rectilinear and oval enclosures, and trackways. The focus of activity within this area is not defined, though the HER records areas of cropmarks as observed on aerial photographs and mapped by the Bedford Borough NMP project.

4.35 Area **MBD22155** comprises a possible settlement area containing hut circles, ditched enclosures, trackways and field boundaries of probably Iron Age to Roman date, Within area **MBB22144**, the NMP recorded cropmark features comprising enclosures, pits and trackways, interpreted as a possible settlement dating from the Iron Age to the Roman, with potential remains of a Roman villa.

4.36 Within area **MBB22153** an extensive complex of curvilinear and subcircular enclosures, trackways and field systems of probable Iron Age or Roman date have been recorded. Area **MBB22156** comprises further evidence of trackways, field boundaries and enclosures and area **MBB22145** contains cropmark evidence of linear boundaries and an enclosure.

4.37 Located c.995m north-west of the site a double ring ditch was observed by the NMP and excavated in 1984 in advance of gravel extraction (**MBD14455**). The feature was interpreted as late Neolithic to early Bronze Age in date. Located c.590m north of the site, two linear features observed as cropmarks were excavated in 2009 (**MBB21998**). The excavation identified the northernmost ditch along with Bronze Age pottery and Neolithic flint. The linear ditches were interpreted as being part of an early prehistoric field system. An excavation in 1957 c.650m north-west of the site (**MBD10807**) recorded evidence of an Iron Age occupation site.

4.38 Cremation burials and inhumations have also been recorded within the study area. Located c.450m north-west of the site, an area of cropmarks suggestive of ring ditches were excavated in advance of gravel extraction (**MBD1478**; see **Plan EDP 2** and **EBB671**; see **Plan EDP 3**). These works found evidence for a secondary cremation burial in one of the ring ditches and a crouched Neolithic burial enclosure containing a young female with a single red deer antler was excavated. A further partial skeleton was found, though this was not within its original context and has been disturbed by flooding. Other enclosures examined were interpreted as late Iron Age stock enclosures, one possibly with internal divisions or stalls.

4.39 Three further sites were investigated in the quarry area, including two Bronze Age ring ditches, a second Iron Age enclosure and two penannular ditches crossed by a post alignment, alongside the remains of an Iron Age complex comprising a double enclosure. Within this area a further crouched inhumation was recorded (**EBD250**; see **Plan EDP 3**).

4.40 To the south of this quarry area, located c.970m west of the site, within an extensive area of cropmarks a Bronze Age ring ditch was excavated in advance of gravel extraction in 1962 (**MBD1618**). Within the feature was the remains of a cremation urn, and two later possible Saxon inhumation burials.

4.41 Located c800m north-east of the site, a human skull was recovered from a gravel extraction pit (**MBD10700**) along with a Neolithic mace head, and Bronze Age beads. The human remains were dated to the late Bronze Age. Located c.630m north of the site the HER records the area encompassing the prehistoric scheduled monuments (**MBD594**), which are discussed above.

4.42 Within the wider area the Bedford Borough NMP project has recorded cropmark evidence of prehistoric activity across the study area including enclosures, trackways, ring ditches and field systems (**MBD770**, **MBD7204**, **MBD16674**, **MBD11392, MBB22160** and **MBB22157**). Further features observed on aerial images, though not through the NMP project are also recorded within the HER (**MBD7810** and **MBD13973**). Whilst the majority of these features have not been archaeologically tested, archaeological works focused on cropmark features identified on aerial imagery within the wider area have confirmed the presence of prehistoric to Roman activity.

4.43 Whilst the cropmarks identified by the Bedford Borough NMP project and excavated features from the wider area would suggest extensive exploitation of the landscape during this period, no evidence has been recorded from within the site and there is no evidence to suggest that associated activity from these areas extended within the site itself. Furthermore, historic aerial photograph evidence (see below) and the geophysical survey undertaken to inform this report within the site recorded no evidence of prehistoric features.

4.44 As such, based on the current evidence it is considered that the site has a low potential to contain significant archaeological remains from this period.

Roman–British (AD43–410)

4.45 There are no heritage assets dated to the Roman period recorded on the HER within the application site, although evidence for Roman activity has been recorded in the wider study area.

4.46 Features suggesting Roman settlement have been recorded within the wider area. Located c100m south of the site the HER records a large area containing evidence of Roman activity (**MDB1861**) and a possible villa, identified through cropmarks observed during the Bedford Borough NMP project, suggesting continued occupation of an Iron Age site.

4.47 A further possible Roman settlement complex is recorded c.630m south-east of the site (**MBD1860**). This comprises a complex of linear ditches, trackways, rectilinear enclosures, sub circular enclosures, maculae and pits of probable Iron Age or Roman date visible as cropmarks on historic aerial photographs and recorded by the NMP. A series of small adjoining rectilinear enclosures to the south appears to represent the focus of settlement

with a predominance of linear ditches and larger rectangular enclosures to the north-west and south-east, possibly representing the adjacent field system and trackways.

4.48 Excavations at Willington Quarry c.965m north-west of the site produced further evidence of Roman occupation of the area. The evidence suggested general occupation and farming in form of enclosures and ditches (**MBB22525**), along with a cremation burial (**MBD14456**) and pottery.

4.49 The site is located within a landscape utilised during the Roman period, likely in the form of small rural settlement sites and wider field systems. Features relating to Roman activity have been recorded c.100m south of the site, though there is no evidence that such activity extends into the site on aerial imagery or the geophysical survey of the site. There is a low possibility that unrecorded features associated with Roman activity and utilisation of the landscape may extend into the site. Though these would likely be of low archaeological significance and may have been truncated by modern uses of the site, which would further reduce their significance.

Early Medieval to Medieval (AD 410–1485)

4.50 No evidence of early medieval activity has been recorded by the HER within the site. Within the wider study area located c.970m west of the site, within an extensive area of cropmarks a Bronze Age ring ditch was excavated in advance of gravel extraction in 1962 (**MBD1618**). Within the feature was the remains of a cremation urn, and two later possible Saxon inhumation burials.

4.51 There are no medieval heritage assets identified on the HER or recorded by the geophysical survey within the site. Features recorded within the wider area are limited to the medieval settlement of Willington (**MBD17076**) and the agricultural use of the surrounding land. The settlement of Willington is recorded within the Domesday Book as having 13 villagers, 1 mill, 9 ploughlands and areas of woodland and meadow, this suggests that a small settlement was established here by the 11th century, although its exact location is unclear.

4.52 The site is located on the eastern edge of the proposed extents of the medieval settlement, though the area mapped by the HER appears to be based on the layout of the village in the late 18th century. It is possible that the medieval settlement was focused towards the western edge of the current village. Located c.950m west of the site, the HER records the site of the historic manor house (**MBD434**), now occupied by the Grade II listed Manor Farm (**1312403**) which dates to the 16th century. Located c.1.1km north-west of the site the HER records a moated site (**MBD768**), which is also visible on historic maps, though is no longer extant. This may have been associated with the former manor house.

4.53 A review of historic maps, aerial images and geophysical survey suggests little evidence that the site was anything other than agricultural land during this period.

4.54 Within the wider area the HER also records areas of ridge and furrow, which is presumed to be of medieval date (**MBD3365**, and **MBD3305**). The geophysical survey within the site recorded a series of roughly parallel responses within the eastern parcel of the site, which

were interpreted as ridge and furrow features. Whilst the exact date of the features is not clear it is possible that these features relate to the agricultural use of the site during the medieval period.

4.55 A further moated site, The Docks (**1012079**; see **Plan EDP 1** and **MBD769**; see **Plan EDP 3**) is located c.320m north of the site. This comprises the scheduled remains of a double island moated site and associated dock next to the River Great Ouse. It was originally one of three interconnected docks at the site. It survives as a rectangular waterfilled pond, measuring approx. 50m by 35m. Its north side is defined by the outer moated enclosure. Excavations within the enclosure uncovered the well-preserved remains of buildings dating to between the 11th and the 14th centuries AD. The dock was originally connected to the River Great Ouse by a channel which has since been backfilled. It is possible that this area around the 'dock' also formed a foci of settlement activity within the earlier medieval period, potentially separate from the moated site to the west and north-west of the village.

4.56 Within the site the geophysical survey recorded linear features, which may represent medieval ridge and furrow plough remains, though there are no further recorded features associated with the medieval period within the site on the HER or historic aerial photos.

4.57 The site is located on the edge of the projected medieval settlement, which appears to be based on the layout of the village in the late 18th century. It is more likely that settlement activity was located to the north and west of the settlement as evidenced by the recorded moated sites and associated structures. It is likely that the site formed part of the agricultural land surrounding the settlement. Any unrecorded features relating to this agricultural use, such as boundary features, below-ground remains of ridge and furrow or plough soils, may be present within the site, although there is no evidence to suggest archaeology of anything greater than low significance survives in the site.

Post-Medieval and Georgian (AD 1485–1837)

4.58 There are no previously identified heritage assets from this period recorded on the HER within the application site. The geophysical survey recorded a series of roughly parallel responses within the eastern parcel of the site, which were interpreted as ridge and furrow features. A small number of assets have been recorded within the wider area, including the majority of the listed buildings within the settlement, and largely relate to the post-medieval growth of the settlement.

4.59 The closest recorded feature on the HER is an area of an osier bed (**MBD18225**) located c.460m north-east of the site, which the HER has dated to the post-medieval period. No other features of this nature have been recorded in within the area.

4.60 Located c.810m to the west of the site are the scheduled monuments and listed buildings of the Dovecote (**1321578**) and the stables (**1114191**). These date to the 16th century and were part of a larger manorial estate which includes St Lawrence's Church and Manor Farmhouse, along with other buildings which are no longer extant (discussed in designated assets section above).

4.61 Within the site the geophysical survey identified ridge and furrow features in the eastern parcel. Historic mapping (see below) further suggests that the site formed part of the agricultural land surrounding the settlement. There is low potential for further unrecorded features relating to this use of the site, though there is no evidence to suggest that it was subject to any agricultural practice that would result in remains of any greater than low significance surviving in the site.

Victorian and Modern (AD 1837–present)

4.62 There are no previously identified heritage assets from this period recorded on the HER within the application site. Within the wider study area, the HER records relate to the growth of the settlement, the railway and quarrying within the wider landscape. The recorded modern buildings within the settlement comprise small agricultural buildings, the pub, a Methodist church, a memorial hall and domestic buildings. Located c.350m north of the site is the route of the Bedford – Sandy Railway (**MBD11833**).

4.63 Historic maps suggest that during the 19th century the site formed part of the agricultural land surrounding the village (see cartographic sources below). Following this, during the mid to late 20th century the site was in use as a plant nursery. During the site visit it was observed that built structures remained within the site associated this use, though they are largely now ruinous.

4.64 Those assets recorded in the wider area outside of the settlement comprise two wind pumps (**MBD1425**, and **MBD1754**), one of which is located c.90m south of the site and is still extant, though not operational. The HER also records several areas of gravel extraction within the wider area (**MBD3098**, **MBD794**, **MBD685**, **MBD488**, **MBB22162**, **MBB22136** and **MBB22003**), although the site itself and its immediate surrounds, have not been subject to quarrying.

4.65 Within the site there are partially extant remains of the buildings associated with the former nursery comprising foundations of the greenhouses, an outhouse and an extant boiler, and further remains were also partially recorded on the geophysical survey relating to the buildings and a former trackway. There is a high potential for further remains relating to the use of the site as nursery, and some potential for evidence of the former agricultural use of the site. It is considered that these features and any further associated features would be of low heritage significance.

Previous Archaeological Investigation

4.66 In September 2019 a geophysical survey of the site was undertaken to inform this report. The full results of this are discussed in **Geophysical Survey** below.

4.67 Within the study area the Bedford HER returned 32 event records. The records provided by Bedford Borough Council were refined in order to narrow the research focus to those of relevance to the present assessment, these are shown on **Plan EDP 3.** As such not all HER event records are therefore referred to, discussed or illustrated within the body of this.

4.68 Located c.70m east of the site archaeological investigations, including evaluations, excavations and a watching brief, took place during the construction of the Huntingdon to Willington gas pipeline (**EBB720**). These recorded evidence of prehistoric and Roman activity within the area including a triple linear ditch and ring ditch feature, as discussed above.

4.69 Located c.260m north of the site archaeological monitoring (**EBB836**) recorded an undated field boundary, along with numerous modern intrusions likely associated with the disposal of domestic refuse from the houses to the south of the development area. An archaeological watching brief (**EBB725**) located c.280m north-west of the site recorded an undated pit feature. This was interpreted as being prehistoric in date.

4.70 Rescue excavations at Danish Camp (**EBB833**) along with a small-scale excavation of the footings of a new visitor centre (**EBB834**), c.325m north of the site, recorded evidence of two early medieval buildings and sections of the moat earthworks. Postholes, possible beam slots and stone wall footings were also recorded, as mentioned above.

4.71 In a large area located c.390m north of the site a number of archaeological investigations including a desk based assessment, geophysical survey, and archaeological evaluations (**EBB680**, **EBD133**, **EBD147**, **EBB559**, **EBB779** and **EBD491**) identified evidence for prehistoric, Roman and post-medieval activity. This area includes the four scheduled monuments. Evidence of enclosures, pits, ditches and postholes, along with artefact scatters was recorded, suggestive of wider use of the area surrounding the scheduled monuments during the prehistoric period.

4.72 Located c.830m north-west of the site, during gravel extraction, a double ring ditch was recorded (**EBB614**), though no associated burial was found and the monument was heavily truncated. Also in this area an Iron Age enclosure and a small Roman enclosure and ditches were recorded during a rescue excavation undertaken by Bedfordshire County Council (**EBB615**).

4.73 Also within the quarrying area a crouched Neolithic burial enclosure containing a young female with a single red deer antler was excavated (**EBB671**). Further quarrying led to the salvage excavation of a truncated late Iron Age/Romano British enclosure. Three further sites were investigated in the quarry area including two Bronze Age ring ditches, a second Iron Age enclosure and two penannular ditches crossed by a post alignment, alongside the remains of an Iron Age complex comprising a double enclosure. A square barrow containing the remains of a crouched inhumation is also recorded in this area (**EBD250**).

4.74 Located c.800m south of the site, a geophysical survey undertaken during the construction of the Willington to Steppingly pipeline (**EBB568**) recorded evidence of a large Romano-British settlement complex. This is located within a larger prehistoric to Roman settlement area.

4.75 There have been a high number of archaeological investigations within the surrounding area, largely focused on the areas of quarrying and surrounding the scheduled monument to the north, with many comprising rescue excavations. No archaeological investigations

have been undertaken within the site aside from the geophysical survey undertaken as part of this assessment. The investigations show that the area was occupied from the prehistoric period onwards, with extensive evidence of said occupation and activity recorded.

Cartographic Sources

4.76 The 1779 Russel Estate map of the village of Willington (**Plan EDP 4**) shows the site as being formed of two or three larger parcels of land. Little detail is given on this map in terms of features within the site though it can be assumed that the land was in agricultural use during this period and appears to be associated with the buildings to the south. Within the wider area the map shows that the settlement within the village was spaced out with no clear centre. It appears to be a series of loosely grouped farm complexes with some smaller buildings along Station Road and Church Road.

4.77 The 1839 Willington tithe map (**Plan EDP 4**) again shows the site as forming part of four larger fields. The tithe apportionment lists the field parcels as being owned by the Duke of Bedford. Plot 99 is recorded as 'house, homestead and house close', associated with White Hart Farm (now known as the Grade II listed 'The Timbers') and as being in use as pasture. Plot 79 is recorded as 'Mill Piece' and as being in use as arable. It is likely that the site formed part of the agricultural land associated with White Hart Farm on the outskirts of the settlement. Within the wider area the map shows the settlement is still sparsely laid out with limited built form.

4.78 The 1901 Ordnance Survey map (not reproduced) shows some elements of further enclosure of the wider area, and the boundaries of the site have been formalised. Though no detail is given regarding the land use at this time it can be assumed that the area was still in agricultural use. Within the settlement there has been very limited development with the main addition being the school.

4.79 A sales brochure dating to 1903 (**Plan EDP 4**) lists the land holdings of the Willington and Cople Estate belonging to the Duke of Bedford, which were to be sold off in parcels. The sales brochure describes the estate holdings as *"highly attractive freehold, country residences, building sites, market garden land and small holdings"*. The site is shown on the sales plan as partially comprising Lot 29/plot 89 and Lot 30/plot 89. Lot 29 comprises 'a brick and tiled house/hovel' along with a parcel of pasture land. Lot 30 comprises two thatched cottages along with a parcel of pasture. It can be seen on this plan that the land has been divided up and is no longer wholly associated with White Hart Farm, nor are the buildings recorded as farmhouses.

4.80 The 1926 Ordnance Survey map (not reproduced) shows the two plots illustrated on the 1903 map as one field, though some of the plot divisions within the wider area have been retained. In terms of growth of the settlement there has been some small-scale development, notably directly to the south of the site and along Church Road.

4.81 The 1973-74 Ordnance Survey map (**Plan EDP 4**) illustrates the later 20th century use of the site as a plant nursery. The site now comprises part of one large field surrounded on the north-west, west and south-west by modern development. Within the site the large building can be seen, along with some smaller associated structures and an access track from Barford Road.

4.82 The historic maps have demonstrated that the site was in agricultural use throughout the 18th to 19th centuries. During the mid 20th century the site was used for commercial nurseries. The later 20th century maps show a large building within the south-western part of the site, which likely comprised greenhouses and associated buildings.

Aerial Photographs

4.83 A total of 71 vertical and 199 oblique aerial photographs, covering the application site and a 1km study area, were identified within the collection maintained by the Historic England Archive in Swindon. These were viewed in July 2019.

4.84 The available images span the period from March 1947 to May 2010 and add detail to the land use and development sequence shown on those historic maps. These images were viewed in July 2019 and identified the cropmarks recorded by the NMP within the wider area (see reference section for list of images viewed).

4.85 The photographs demonstrate that the site was in use as a nursery from the mid 1940s onwards, with images showing the planting areas and agricultural buildings within the western area of the site.

4.86 To the east, the land within the site is shown as forming part of a larger agricultural area, possibly also associated with the nursery.

4.87 No cropmark or earthwork features, suggesting the presence of any form of archaeological activity, were identified on aerial photographs within the application site such as those observed within the wider area.

Site Walkover

4.88 The site was visited in July 2019 to assess the current ground conditions and topography within it, as well as to confirm the continuing survival of any known archaeological remains and to identify any hitherto unknown remains of significance. At the time of the visit the western part of the site comprised mown grass with clumps of mature trees, with the eastern part of the site comprising tall waist high grass.

4.89 The vegetation on the eastern part of the site obscured any potential earthworks or features. Within the western part of the site the mown grass allowed for good visibility of the natural topography and the identification of potential earthworks. It was observed that in the south-western area one of the boiler towers (**Image EDP 1**) and foundations of the

former greenhouses survived (**Image EDP 2**), along with a former outhouse and other building remains (**Image EDP 3**). These remains are relatively substantial and would have likely required some level of previous below ground works for foundations and utilities.

4.90 No evidence for further archaeological remains was noted within the site, and as detailed in **Section 5**, no potential adverse effects were identified in respect of designated heritage assets in the surrounding landscape.

Geophysical Survey

4.91 In September 2019 a geophysical survey was undertaken within the site, as part of this application (**Appendix 1**). The large majority of the site was surveyable with the exception of those areas which were densely treed, and where extant buildings and building foundations survived.

4.92 Within the western parcel of land an uncertain response, which formed a semi-circular shape, potentially indicated a feature of archaeological origin, however, the response was to0 weak to fully define and interpret what the feature was. A few weak pit-like anomalies were also detected, though these were not defined and formed no obvious pattern, so have also been classified as uncertain features.

4.93 A series of roughly parallel responses were detected in the eastern parcel, which reflect former ridge and furrow practices.

4.94 A magnetic disturbance in the western area correlated with the location of a former building recorded on Ordnance Survey (OS) mapping from 1974. Alongside this a band of magnetic disturbance in the eastern area marks the route of a trackway also located on the 1974 OS map.

4.95 Smaller scale ferrous anomalies were present across the site. These were characteristic of small pieces of ferrous debris (such as brick or tile) interpreted to be of modern origin.

4.96 Overall the survey recorded *no anomalies of archaeological interest*. Based on this it is considered that there is low potential for significant archaeology to survive within the site.

Section 5
Assessment

5.1 This section sets out any potential direct or indirect impacts on designated heritage assets arising from the development of the site, along with assessing the archaeological potential of the site based on the evidence presented in **Section 4.**

5.2 The proposed development is for 33 dwellings with associated landscaping and access.

Designated Heritage Assets

5.3 This section assesses the likely impact of the implementation of the proposed development upon the significance of those heritage assets whose settings it is determined are capable of being affected, specifically addressing Steps 3 and 4 of the five-step approach to setting assessment described in the guidance (HE 2017). The locations of all designated heritage assets identified in this section are detailed on **Plan EDP 1.**

5.4 There will be no direct effects on any designated heritage assets as a result of the proposed development proceeding. However, **Section 4** has identified those heritage assets which could *potentially* receive an effect in terms development within their setting. These comprise:

- The Timbers (**1114187**), Grade II, located c.70m south of the site; and
- Clumbercote (**1114195**), Grade II, located c.40m west of the site

The Timbers

5.5 The Timbers (**1114187**) is located c.70m south-west of the site. The Historic England listing records the asset as:

"House. C17. Timber framed construction with red brick infill. Old clay tile roof. 3-room plan, 2 storeys, with 2-storeyed porch (rebuilt, or a C20 addition) to front elevation. Front: 3 hipped dormers with windows above and below wall plate. Windows in similar positions to ground floor. All windows are C20 casements with diamond leading. Porch wing, in line with red brick double ridge stack, has door to E side, and brick inscribed "T.C. 1692" set into front. E elevation: gable rebuilt, with pebbledash render and mock timber framing. Lean-to C20 extension to RH. Rear elevation: C20 projecting 2 storeyed double-gabled block, with mock timber framing and colourwashed plaster infill."

5.6 The house is currently in use as a dwelling with an associated garage. Historic maps suggest the house was formally known as White Hart farm, though it likely was no longer in use as a farmhouse by the 20th century. The 1903 sales brochure records the building as a 'brick and tiled hovel' with associated garden and pasture. Given the building's current

appearance and usage this suggests that the building has been subject to some level of re-building or alteration to make it habitable. The significance of this asset is primarily its historic and architectural interest, derived from the historic form and fabric of the building.

5.7 The tithe map (**Plan EDP 4**) shows that the site formally formed part of the land associated with The Timbers when it was White Hart Farm. By the mid-20th century, however, the site was no longer associated with The Timbers. Modern development to the north and east of the building has further disassociated it with the land within the site. It was observed during the site visit that there is no intervisibility between the site and the asset (**Image EDP 4**).

5.8 In terms of the current setting of the asset, the building is located within a private garden area, which is bounded by mature trees to the west, north and east, and a low fence to the south. The house is slightly set back from the road within this garden area. The house is placed on the junction of five roads going to and from Willington. The roads a relatively busy, with Barford Road and Sandy Road being the main roads through the village,

5.9 The main façade faces south towards the road, and it is from the road that one can experience the built form of the asset, particularly the black timber frames. The placement alongside these roads, and the private garden area forms an element which makes a positive contribution to the significance of the building, being the main experience of the asset.

5.10 Although there is a historic link between land within the site and the listed building there is no longer any tangible manifestation of this. As such, it is considered given the lack of experience due to modern development and mature vegetation screening, along with the change in use of the land, that the site no longer forms any part of the setting of The Timbers and development of the nature proposed would cause no harm to its significance.

Clumbercote

5.11 Clumbercote (**1114195**) is located c.40m west of the site. The Historic England list entry for the asset records the asset as:

"House. C17. Colourwashed roughcast render over timber framed construction. Thatched roof, hipped to S. 3-room plan, one storey and attics. 2 3-light and one 2-light casements to ground floor, 2 dormer windows with 3-light casements. All windows C20. C20 gabled thatched porch between 2 RH bays. Rebuilt red brick stack to S end. Slightly later single-storeyed extension to N gable end with hipped thatched roof"'

5.12 The 1779 Map (**Plan EDP 4**) shows the building as two semi-detached dwellings, though on the 1839 tithe map (**Plan EDP 4**) it is shown as one building, though the apportionment records it as two cottages with associated garden. It is again shown as two dwellings on the early 20th century maps and the 1903 sales brochure records the building and two separate plots, as two stud and thatched cottages with gardens. The significance of this asset is primarily the historic and architectural interest of the building, derived from the historic form and fabric of the building.

5.13 With regard to the current setting of the asset, it sits within its own garden areas which lie to the east and west of the property and the road side placement. The main façade of the cottage faces west towards Station Road, which is the main experience of the asset (**Image EDP 5**). The asset is experienced entirely within the context of surrounding 20th century residential developments, which now spread along Station Road both to the north and south of the building, and line the opposite side of the road.

5.14 During the site visit it was observed that there are glimpsed views from within the site, mainly of parts the roof, of the asset. (**Image EDP 6**). However, this is within the context of the surrounding modern development, with partial screening from vegetation and does not form the key appreciation of the building's significance. The site is not perceptible in views of the asset from the west, which are limited to the trees within and bounding the site, and the area itself is not discernible (**Image EDP 7**). Furthermore, it is not considered that any of the views of the asset from the site or the site from the asset convey any heritage interest or contribute to its significance.

5.15 Whilst the site is considered to form part of the setting of Clumbercote, in terms of the limited experience of the asset and site, based on the current evidence there is no reason to suggest that the site makes any contribution to its significance. The proposals have the potential to change the views from within the site towards the asset, and there is potential for the introduction of glimpsed built form into the backdrop of the asset when viewed from the road. However, such change is not considered to constitute harm to the asset or the appreciation of the significance of the asset.

5.16 Retention and strengthening of the vegetation boundaries along the western side of the site would help to minimise changes arising from the proposed development.

Non-designated Heritage Assets

5.17 Within the site the geophysical survey recorded evidence of ridge and furrow within the eastern part of the site. The survey also recorded a couple of uncertain anomalies, comprising a semi-circular feature and isolated pit features. The survey report concluded that no features of archaeological interest were recorded within the area, with those features recorded either uncertain in origin or of low archaeological significance.

5.18 From the mid 20th century to the early 21st the site was used as a plant nursery. During the site visit it was observed that built structures remained within the site associated with the former nursery, though they are largely now ruinous. The geophysical survey of the site recorded further evidence of these buildings along with part of a former trackway recorded on historic maps.

5.19 Despite the relatively rich archaeological resource dating to the prehistoric and Roman period within the wider area, there is no evidence to suggest that features relating to this extend into the site, or that any features of high archaeological significance would be present. Any features predating the modern period which do survive within the site would

likely have been truncated by the modern agricultural use of the site, which would further reduce their significance.

5.20 There is a high potential for further remains relating to the use of the site as nursery, and some potential for evidence of the former agricultural use of the site. It is considered that these features and any further associated features would be of low heritage significance.

Section 6
Conclusions

6.1 This Archaeological and Heritage Assessment concludes that the application site does not contain any world heritage sites, scheduled monuments, registered parks and gardens, registered battlefields or listed buildings, where there would be a presumption in favour of their physical preservation *in situ* and preclude development within the site.

6.2 Potential impacts upon the settings of the designated heritage assets in the wider study area have been considered. Although there is a historic link between land within the site and The Timbers to the south, it is considered that given the degree of separation due to modern development and mature vegetation screening, along with the change in use of the land, that the site no longer forms any part of the setting of these assets.

6.3 In relation to the Grade II listed Clumbercote to the west, it was observed that the asset was partially visible from within the site, with the site discernible by its tree lined boundary from the asset. As such the site currently forms a part of the setting. However, based on the current evidence, it is considered that such limited experience does not contribute to the significance of the asset. Introduction of built form within the site would result in a change to wider setting, however this is not considered to constitute harm. Retention and strengthening of the existing vegetation within the site will help to minimise this change.

6.4 With regard to those listed buildings within the wider area, it has been determined that these buildings do not possess any historical association with the land within the site and, furthermore, the site is not experienced from or in combination with any of these assets due to their form and their topographic and geographic locations such that the site does not form part of their setting

6.5 As such, this assessment concludes that the implementation of the proposed development will not result in an adverse impact on, harm to, or loss of significance from any of the identified designated heritage assets, either in terms of an effect on their physical fabric or through changes to their wider setting.

6.6 With regard to non-designated heritage assets, the site is located within the Great Ouse valley which has a high number of recorded archaeological sites dating from the prehistoric period onwards. Despite this, no evidence of prehistoric or Roman activity was recorded within the site. The geophysical survey within the site recorded a potential semi-circle feature within the western parcel of the site, though the date and origin of this is uncertain.

6.7 The site is located on the edge of the projected medieval settlement of Willington, though there is no suggestion that the site was anything other than agricultural land during this period. The geophysical survey recorded evidence of ridge and furrow within the site suggestive of post-medieval or later agricultural practices.

6.8 A review of the HER data, aerial images and historic maps show that during the 20th century the site was in use as a plant nursery. Within the site there are partially extant remains of

the buildings associated with the former nursery, and further remains were also partially recorded on the geophysical survey. Any such features which do survive would likely be of low archaeological significance.

6.9 It is considered that there is a low potential for further unrecorded features relating to the prehistoric to Roman period within the site.

6.10 However, there is a high potential for further remains relating to the use of the site as nursery, and some potential for evidence of the former agricultural use of the site. It is considered that these features and any further associated features would be of low heritage significance.

6.11 As such, there is no reason to believe or expect that the site will contain archaeology of such significance that it would require preservation *in situ* and preclude development of the site. Any below-ground deposits that are present are likely to be poorly preserved due to modern uses of the site, thereby reducing their significance.

6.12 It is considered that the current level of assessment, including the findings of the geophysical survey, is adequate to inform a planning application for development within the site, and that the proposed development accords with current legislation, the planning policies contained within the NPPF and the policies of the Local Plan.

Section 7
References

Chartered Institute for Archaeologists (CIfA) 2017 *Standard and Guidance for Historic Environment Desk-based Assessment* (Reading)

Department for Communities and Local Government (DCLG) 2019 *The National Planning Policy Framework* London

Historic England (HE), 2017, *Historic Environment Good Practice Advice in Planning Note 3 (Second Edition): The Setting of Heritage Assets,* London

Historic England (HE), 2016, *Conservation Area Designation, Appraisal and Management, Historic England Advice Note 1,* London

Ahern, K., *et al*, *Bedford Borough Landscape Character Assessment*, 2014, LUC

List of Consulted Maps

1779 – Russel Estate Map Showing the Village
1839 – Willington Tithe Map
1901 – Ordnance Survey Map
1903 – The Willington and Cople Estate near Sandy Bedfordshire
1973-4 Ordnance Survey Map

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Images EDP 1–7

Image EDP 1: View of a surviving boiler tower within the site. This is associated with the 20th century nursery on site.

Image EDP 2: View of the remains of the 20th century nursery buildings within the south-western part of the site.

Image EDP 3: View of extant outhouse and partially extant structure within the south-western part of the site.

Image EDP 4: View from within the site, facing south towards The Timbers, illustrating the lack of intervisibility between the listed building and site.

Image EDP 5: View of the Grade II listed Clumbercote house, facing east, illustrating the road side placement and front garden area.

Image EDP 6: View from within the site, along the western boundary facing west, towards the Grade II listed Clumbercote house, illustrating the intervisibility between the site and the asset.

Image EDP 7: View from Station Road, facing east towards the Grade II listed Clumbercote house and the site, illustrating the lack of visibility of the site area from the asset and the placement of the outbuilding within the garden area of Clumbercote.

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Appendix EDP 1
SUMO – Geophysical Survey Report 15832, September 2019

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GEOPHYSICAL SURVEY REPORT

Land North of Barford Road, Willington, Bedfordshire

Client

The Environmental Dimension Partnership

For

Clarendon Land and Development, Mr P Phipp, Mr S Hesford and Mrs Z Hesford

Survey Report

15832

Date

September 2019

Survey Report 15832: Land North of Barford Road, Willington, Bedfordshire

Survey dates	3 September 2019
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Report Date	17 September 2019
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TABLE OF CONTENTS

1. LIST OF FIGURES

Figure 01	NTS	Site Location
Figure 02	1:1000	Magnetometer Survey Greyscale Plots
Figure 03	1:1000	Magnetometer Survey Interpretation
Figure 04	1:1000	Magnetometer Survey [Minimally Processed] Greyscale Plots

2. SURVEY TECHNIQUE

Detailed magnetic survey (magnetometry) was chosen as the most efficient and effective method of locating the type of archaeological anomalies which might be expected at this site.

Bartington Grad 601-2 Traverse Interval 1.0m Sample Interval 0.25m

3 SUMMARY OF RESULTS

3.1 A magnetometer survey of 2ha at Willington, Bedford revealed no anomalies of archaeological interest. A couple of uncertain responses have been detected along with anomalies reflecting former ridge and furrow cultivation. Magnetic disturbance within the dataset correlates with the locations of a former building and trackway.

4 INTRODUCTION

4.1 **SUMO Geophysics Ltd** were commissioned to undertake a geophysical survey of an area outlined for development. This survey forms part of an archaeological investigation being undertaken by **The Environment Dimension Partnership** on behalf of **Clarendon Land and Development, Mr P Phipp, Mr S Hesford and Mrs Z Hesford.**

4.2 Site details

NGR / Postcode	TL 11582 49874 / MK44 3QT
Location	The survey area is located 5km east of Bedford in Willington. The site is bound to the west by houses off Station Road, to the south by Barford Road and houses off Barford road.
HER	Bedford Borough Council
District	Bedford
Parish	Willington Civil Parish
Topography	Flat
Current Land Use	Arable in Area 1 and short grass in Area 2.
Geology (BGS 2019)	Bedrock: Peterborough Member - mudstone Superficial: River Terrace Deposits, 1 to 2 - sand and gravel
Soils (CU 2019)	Soilscape 6: freely draining slightly acid loamy soils.
Archaeology (EDP 2019)	The closest recorded prehistoric feature is located c.40m east of the site (MBD985) which comprises of a triple linear boundary running north to south between the river and the main road through Willington. This has been interpreted as being Iron Age in date, though this has not been archaeologically tested. A ring ditch is also visible to the south east of the boundary feature (MBB22161), c.220m east of the site. Located c.100m to the east of the site (MBB22158) is a further series of possible Iron Age boundary ditches. Adjacent to this feature, c.260m east of the site (MBB22159) is a further possible round barrow. Located c.100m south of the site is an area of extensive cropmarks, located along an eastward flowing stream course (MDB1861, 22155, 22144, 22153, 22156, 22145). Features within this area suggest extensive occupation from the prehistoric/Romano-British period. Located c.100m south of the site (MDB1861) the HER records evidence of a Roman village and associated villa suggesting continued occupation of an Iron Age site. A further Roman settlement complex is recorded c.630m south east of the site (MBD1860). A complex of linear ditches, trackways, rectilinear enclosures, sub circular enclosures, maculae and pits of probable Iron Age or Roman date are visible as cropmarks. A medieval moated site is located c.300m north of the site and is located on the edge of the projected medieval settlement, which appears to be based on the layout of the village in the late 18th century.
Survey Methods	Magnetometer survey (fluxgate gradiometer)
Study Area	2ha

4.3 Aims and Objectives

To locate and characterise any anomalies of possible archaeological interest within the study area.

5 RESULTS

The survey has been divided into two survey areas (Areas 1-2). Areas of dense trees in Area 2 rendered some of the area unsurveyable.

5.1 *Probable / Possible Archaeology*

5.1.1 No magnetic responses have been recorded that could be interpreted as being of archaeological interest.

5.2 *Uncertain*

5.2.1 An Uncertain response in Area 2 appears to form a semi-circular shape which could indicated an archaeological origin; however, the response is too weak to fully define and interpret with any degree of confidence. A few weak pit-like anomalies have been detected which are ill-defined and form no obvious pattern; therefore, they have been classified as *Uncertain*.

5.3 *Agricultural – Ploughing*

5.3.1 A series of roughly parallel responses have been detected in Area 1 which reflect former ridge and furrow agricultural schemes.

5.4 *Ferrous / Magnetic Disturbance*

5.4.1 Magnetic disturbance in Area 2 correlates with the location of a former building seen on old OS mapping from 1974. A band of magnetic disturbance in Area 1 marks the route of a former trackway also located on former OS mapping.

5.4.2 Ferrous responses close to boundaries are due to adjacent fences and gates. Smaller scale ferrous anomalies ("iron spikes") are present throughout the data and are characteristic of small pieces of ferrous debris (or brick / tile) in the topsoil; they are commonly assigned a modern origin. Only the most prominent of these are highlighted on the interpretation diagram.

6 DATA APPRAISAL & CONFIDENCE ASSESSMENT

6.1 Historic England guidelines (EH 2008) Table 4 states that the typical magnetic response on the local soils / geology is variable to poor. The results from this survey indicate the presence of pit-like responses and ridge and furrow ploughing; as a consequence, there is no *a priori* reason why archaeological features would not have been detected, if present.

7 CONCLUSION

7.1 No magnetic responses have been recorded that could be interpreted as being of archaeological interest. A few weak pit-like responses and a trend have been detected and have been classified as uncertain. Anomalies reflecting former ridge and furrow ploughing has been detected along with areas of magnetic disturbance which correlate to the locations of a former building and trackway seen on old OS mapping.

8 REFERENCES

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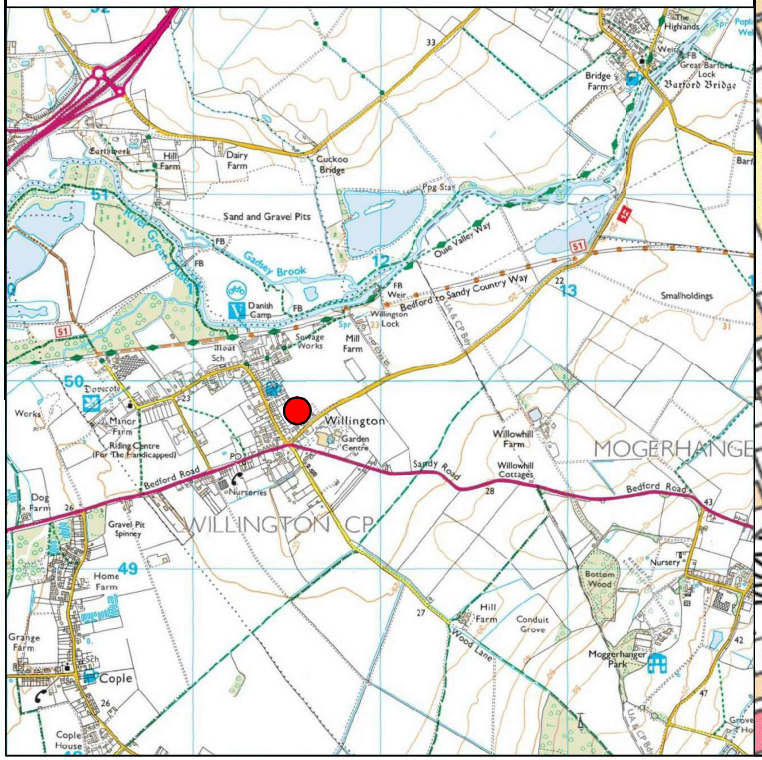

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	Site Location
	Magnetometer Survey

sumo Survey
GEOPHYSICS FOR ARCHAEOLOGY & ENGINEERING

Title: Site Location

Client: Environmental Dimension Partnership

Project: 15832 Land North of Barford Road, Willington, Bedfordshire

not to scale

Fig No: 01