CONTENTS

9.1 INTRODUCTION

9.1.1 This Chapter of the ES has been prepared by Wardell Armstrong LLP and comprises an ecological impact assessment of the Proposed Development and the likely significant effects in terms of ecology and nature conversation at the Site known as Land at Wykham Park Farm. A description of the Site and the application proposals are set out in Chapter 2.

9.1.2 The chapter describes the assessment methodology; establishes the baseline conditions currently existing at the Application Site and surroundings; the likely significant environmental effects; the mitigation measures required to prevent, reduce or offset any significant adverse effects; and the likely residual effects after these measures have been employed.

9.1.3 This chapter should be read in conjunction with Appendices 9.1 to 9.12, which provide further detail regarding habitat and species survey and assessment.

9.2 ASSESSMENT METHODOLOGY

Scope

9.2.1 The ecological impact assessment of the Proposed Development comprises:

- Data-gathering of existing information on the proposed Site and its surroundings from various sources;
- An initial survey of the proposed Site, combined with an assessment of the potential for protected species (such as badger *Meles meles*, bats, dormice *Muscardinus avellanarius*, great crested newt *Triturus cristatus*, otter *Lutra lutra*, water vole *Arvicola amphibious* and breeding birds) undertaken by Halcrow Group Ltd (hereafter referred to as Halcrow);
- An Extended Phase 1 Habitat Survey and updated survey and protected species surveys for badgers, bats and great crested newts undertaken by Wardell Armstrong LLP;
- An evaluation of the Site in terms of its nature conservation value;
- An assessment of the potential ecological impacts of the Proposed Development including habitat loss and fragmentation, disturbance and potential off-site impacts;
- An assessment of the potential cumulative ecological impacts of the development and land use proposals for parcels of land adjacent to the application area, namely the Land East of Bloxham Road (application reference 12/00080/OUT) and potential ecological impacts on the District Wildlife Sites; Salt Way potential Local Wildlife Site (pLWS) and Bretch Local Wildlife Site (LWS);
- Proposed mitigation measures in respect of adverse impacts; and
- Identification of residual impacts, taking into account proposed mitigation measures.

Data sources

Enquiries

9.2.2 Background information on relevant wildlife designations and records of species that are scheduled, rare (at national or local level) or nationally scarce, within 2km of the Site was requested from Thames Valley Environmental Records Centre by Halcrow in 2012.

9.2.3 The Multi-Agency Geographic Information for the Countryside (MAGIC)[1] and Natural England's 'Nature on the Map'[2] websites have been utilised to gather data.

9.2.4 Additionally, the UK and Oxfordshire Biodiversity Action Plans (BAP) were also reviewed. BAPs are the delivery mechanism for the conservation of species listed on Section 41 (England) of the Natural Environment and Rural Communities Act (NERC) 2006.

9.2.5 Cherwell District Council's Ecologist has been contacted regarding the scope of survey work for bats and invertebrates (details provided in subsequent paragraphs).

Assessment approach

Survey Methodologies

Extended Phase 1 Habitat Survey

9.2.6 An initial survey of the Proposed Development was undertaken by Halcrow in 2012. During the subsequent surveys undertaken by Wardell Armstrong LLP in August 2012 and April 2014, an Extended Phase 1 Habitat Survey was also undertaken during which the habitats were checked broadly following the techniques outlined in the *'Handbook for Phase 1 Habitat Survey'* (Joint Nature Conservation Committee, 2010)[3] and the *'Guidelines for Baseline Ecological Assessment'* (Institute of Environmental Assessment, 1995)[4.] The purpose of these surveys was to map the habitats present within the development area and to make an assessment of the potential for protected species to be present within the Site.

9.2.7 An additional parcel of land along the eastern boundary of the Site has been included as part of this application and therefore a further walkover survey to check the habitats and the potential for protected species was undertaken in July 2014.

9.2.8 Target notes were used to describe habitat and species composition and highlight features of ecological interest and are attached as Appendix 9.1. Drawing CA10769-9.1 within Appendix 9.12 shows the location of ecological features and target notes.

[1] www.magic.gov.uk

[2] www.natureonthemap.org.uk

[3] Joint Nature Conservation Committee (2010). *Handbook for Phase 1 Habitat Survey – a Technique for Environmental Audit*. JNCC.

[4] Institute of Environmental Assessment (1995). *Guidelines for Ecological Assessment.* E & F Spon, London

Plant names follow *'New Flora of the British Isles'* [Stace, 1997 (2nd edition)][5]. The common and scientific name of each of the botanical species is provided when first mentioned in the text, but only the common name is stated thereafter.

9.2.9 The presence of a legally protected species is a material consideration for a local authority dealing with planning applications for any development that would be likely to result in harm to the species or its habitat (National Planning Policy Framework, 2012). Therefore, preliminary investigations were undertaken during the Extended Phase 1 Habitat Survey in respect of the potential presence of legally protected species and BAP species. An overview of species protection is provided in Appendix 9.2.

9.2.10 Following the initial survey, Halcrow recommended that further detailed surveys for badger, bats and hedgerows should be undertaken. These additional surveys were undertaken by Wardell Armstrong LLP in August and September 2012 and repeated in April and July 2014, where necessary.

9.2.11 Amphibian surveys were also undertaken by Wardell Armstrong LLP between May and June 2013.

Hedgerow Assessment

9.2.12 A hedgerow assessment was undertaken in August 2012 and updated in April 2014 and July 2014. A description of each hedgerow is found in the target notes attached as Appendix 9.1. Hedgerows were assessed broadly following the criteria for 'important' hedgerows under the Hedgerow Regulations 1997 (wildlife and landscape). The criteria are complex, and include hedgerows which have 7 woody species; hedgerows with 6 woody species plus at least 3 of the features identified in sub-paragraph 4 of the criteria (e.g. one standard tree for every 50m hedgerow length); or at least 5 woody species at least 4 of the features specified in sub-paragraph 4. The application of the criteria to the hedgerows relates mainly to the flora species present and is not an exhaustive assessment. The hedgerow assessment is provided in Appendix 9.3.

Fauna Surveys

Amphibians

[5] Stace, C. (1997) *New Flora of the British Isles 2nd edition.* The Bath Press, Bath.

9.2.13 Amphibians rely on waterbodies (typically ponds, but also slow moving small water courses) for breeding but otherwise they spend much of their time on dry land. They may enter a period of low activity as temperatures fall below 5˚C. This generally begins in late September and by the end of November most amphibians are dormant for much of the time. Amphibians seek refuge over winter in sites similar to those sought during the day such as an underground crevice or crack, a void in a tree stump or bank or under refugia such as piles of rock or dead wood. Adult amphibians migrate to breeding ponds in spring, and sometimes as early as the first frost free days, at the end of January.

9.2.14 On land amphibians engage in foraging, dispersing and resting. Foraging takes place mostly during hours of darkness over a range of habitats that support invertebrate species. Movement at night may reduce the risk of predation and desiccation.

9.2.15 Whilst on land, outside the over-wintering period, amphibians may require refuges from extremes of weather (i.e. high temperatures and dry periods) and may rest in areas of dense vegetation, under refuges or underground.

9.2.16 The habitats on Site were assessed for their potential to provide breeding and foraging habitat and shelter for great crested newts (GNC) and other amphibians.

9.2.17 Ordnance Survey maps and aerial photographs were also reviewed to identify if any waterbodies were present within 500m of the proposed Site. The pond locations are shown on Drawing Number 9.10 within Appendix 9.12. Ponds P1 and P2 are located approximately 240m to the north-west of the Site and Pond P3 is located approximately 200m to the west of the Site. Ponds P4 and P5 are located approximately 500m from the south-western corner of the Site in the grounds of a school. Pond P6 is situated approximately 85m at its nearest point from the Site boundary.

9.2.18 Additionally, where access was available, Wardell Armstrong LLP assessed the waterbodies within 500m of the Site boundary (where possible) for their potential to provide suitable breeding habitat for great crested newt. This pond scoping exercise was undertaken on the 16th May 2013 on Ponds P1 to P5.

9.2.19 Pond 6 could not be scoped for its suitability or surveyed because access was not granted by the landowner. Contact was attempted by letter and through a door knocking exercise on several occasions, but all attempts were unsuccessful.

9.2.20 This pond was not visible on aerial photographs but may be concealed by trees. This suggests that the pond is heavily shaded. There is also evidence that this pond may be dry. OS maps show that this pond is fed by a ditch. Part of this ditch occurs along the southern boundary of the Site which was found to be heavily overgrown and dry. The ditch entered a culvert at the Site boundary and appeared to continue in an easterly direction for an unknown distance downstream. The approximate diameter of the single culvert pipe is 375mm, but it was found to be almost 100% blocked (see Flood Risk Assessment attached as Appendix 12.1 – Water Resources). This suggest that little, if any, water has flowed along this ditch recently and therefore the water level in Pond P6 is likely to be low or not present.

9.2.21 The Site boundary of the Proposed Development includes a further parcel of land to that assessed in respect of the previous application for Land at Wykham Park Farm extending southwards along the eastern boundary to Wykham Lane. Whilst this brings another waterbody (P7) within 500m of the Site boundary (P7 is located approximately 320m to the south of the Site), it is located beyond 500m of the proposed foot-print of the on-site built development parcels. This waterbody is annotated as a reservoir on Ordnance Survey mapping and are generally considered to have low potential to support GCNs. Furthermore, of those ponds surveyed as part of this assessment that were found to contain GCN, P7 is located at a distance of more than 500m.

9.2.22 The scoping survey is based on the Habitat Suitability Index (HSI) which is calculated for ponds on or within 500m the Site. The HSI has been developed as a way of evaluating habitat quality and quantity for great crested newts. The HSI score is now required as part of the Natural England disturbance licensing system for each water body that would be subject to activities likely to result in adverse impacts to a local GCN population. The HSI is a numerical index between 0 and 1 (with 1 being optimal habitat) and uses ten suitability indices, all of which are factors thought to affect GCN but can only be calculated for still waterbodies and not moving watercourses. The HSI can be broken down into:

- <0.5 = Poor

- 0.5 – 0.59 = below average
- 0.6 – 0.69 = average
- 0.7 – 0.79 = good
- >0.8 = excellent

GCN Surveys

9.2.23 The principal guidance for undertaking GCN surveys is provided in the English Nature document '*Great crested newt mitigation guidelines'* (August 2001). Further guidance on survey effort is also provided in the Method Statement Template for a Natural England disturbance licence application introduced in January 2008 (revised in April 2013).

9.2.24 The guidelines recommend that up to four visits should be undertaken in order to determine presence / likely absence of GCN under a survey licence from Natural England.

9.2.25 If GCN presence is confirmed, then two additional survey visits are undertaken (giving a total of 6), in order to carry out a GCN population size class assessment.

9.2.26 These surveys need to be undertaken between the months of mid-March and mid-June, with at least two (for presence / likely absence) or three (for population size class) of these surveys undertaken between mid-April to mid-May.

9.2.27 Surveys for GCNs were undertaken on the 16th, 20th, 23rd and 29th May 2013 at Ponds P1 to P5. As GCNs were present in Ponds P1 and P5, a further two surveys of these ponds were undertaken on the 6th and 13th June 2013.

9.2.28 Three survey methods are recommended in the guidelines: torchlight inspections after dusk, overnight "bottle-trapping" and egg searching. All three survey methods were employed where appropriate and safe to do so.

Torch Light Survey

9.2.29 This method involves scanning the pond at night using a high powered torch (with a minimum of 50,000 candle power). This method can be a simple and effective way of detecting newts in clear ponds, however in turbid or heavily vegetated ponds can be limiting.

Bottle Trapping

9.2.30 This method involves setting traps, which are made from 2-litre plastic bottles, around the margins of the pond at a density of approximately one trap per two metres of shoreline. Guidelines recommend that traps should be set at dusk and checked between 0600 and 1100 hours the following morning. This can be one of the most effective methods for detecting the presence of GCNs, particularly in turbid or heavily vegetated ponds.

Egg Searching

9.2.31 This method involves searching submerged vegetative material (both live and dead) for GCN eggs. As this method requires the eggs to be 'unwrapped' from the leaf to confirm identification this has the potential to increase predation and exposure of the eggs to UV rays. Consequently only small areas of vegetation are systematically unwrapped and once GCN has reliably been identified this method is terminated. Egg searching can be an effective method for detecting presence of great crested newts, however eggs can prove difficult to find in heavily vegetated ponds, where a small population is present, or where vegetation is not easily accessible.

Badgers

9.2.32 All information relating to badgers has been provided within the confidential badger report Appendix 9.4 and is not for general public release.

Bats

9.2.33 Bats roost in a variety of places. Roosting habitat includes buildings and structures, caves and trees and refers to any structure or place that is used for shelter or protection whether or not bats are present at the time.

9.2.34 Bats also use a variety of habitats for foraging with broad-leaved woodland and water habitats being the most favourable. Arable, improved grassland and moor land are less favoured. Within these less favoured landscapes, linear features such as hedgerows, lines of trees and riparian strips are often used by bats as they provide rich food sources, shelter and commuter corridors.

9.2.35 During the initial survey, Halcrow assessed the habitats for their potential to provide food sources and navigation routes for bats. Additionally, the trees on Site were assessed for their potential to support roosting bats.

9.2.36 Potential impacts on bats arising from the Proposed Development were considered at an early stage to inform the design of the emergence/re-entry and activity surveys. The hedgerows and trees with bat roost potential were considered to be the most important habitats for bats within the Site. The arable fields were considered to be of negligible value to bats. Some hedgerow loss was anticipated as part of the development, however the importance of the hedgerows as foraging and flight-lines for bats and the location of the trees with bat roost potential were taken into consideration as part of the master-planning for the Site and opportunities to plant new hedgerows, enhance existing hedgerows and create habitats within new areas of public open space for bats were identified.

9.2.37 It was therefore considered that potential residual impacts on bats from the development proposed in 2012 would likely be low and that dusk and dawn survey visits in August and September 2012 would be sufficient to determine which habitats were being used by bats within the Site, to identify the majority of bat species using the Site, and to ascertain if any of the trees were being used as bat roosts. This survey effort was considered appropriate to provide enough information to enable an impact assessment on bats to be carried out.

August is a particularly productive time to undertake dawn re-entry surveys as inexperienced young bats are more likely to be detected as they try to re-enter roosts. Therefore, dusk/dawn bat activity surveys were undertaken between 14th and 17th August as well as between 11th and 14th September 2012. At the beginning of each dusk survey an emergence survey was undertaken and at the end of each dawn survey a dawn re-entry survey was undertaken at mature trees with the potential for bat roosts. The bat activity surveys were undertaken to establish the bat foraging and commuting activity on Site.

9.2.38 The survey broadly followed the guidance provided in '*Bat Surveys – Good Practice Guidelines*'[6]. Transects were walked to allow complete coverage of the Site by two surveyors. The starting point for the transects and the directions they were walked were altered between each survey. The transects walked and the mature trees observed during the August surveys are shown on Drawing CA10769-9.2 and the September surveys are shown on Drawing CA10769-9.3 (drawings within Appendix 9.12). A Bat Box Duet bat detector was used to detect foraging or commuting bats

[6] The Bat Conservation Trust (2012) Bat Surveys – Good Practice Guidelines, 2nd edition. Bat Conservation Trust, London

and digital recordings were made from the bat detector and analysed later using BatSound analysis programme version 3.31. Observations of bat behaviour, size and the direction of the flight path were also noted where possible.

9.2.39 An update habitat survey was carried out on the 22nd April 2014. During the survey the trees were re-checked and reassessed for their potential to support roosting bats. No changes to trees were recorded along the hedgerow H12 but there were a number of trees located along the Salt Way (H1) which had recently split/cracked limbs and/or had new holes visible. (See Appendix 9.6).

9.2.40 The update habitat survey also included an assessment of the narrow eastern parcel of land, not included in the previous application. No trees considered to have the potential to support roosting bats were noted during this site visit.

9.2.41 Cherwell District Council's ecology officer has confirmed that no further update bat surveys are required. Concluding that additional surveys would be unlikely to reveal anything significantly different from those carried out previously; no known or potential roots will be lost as part of the development; and the boundary hedgerows are being retained. (see Appendix 9.5).

Birds

9.2.42 All wild birds, their nests and eggs are protected throughout the breeding season (1st March to 31st August) under the Wildlife and Countryside Act 1981 (WCA) (as amended), which makes it an offence intentionally (with certain limited exceptions and in the absence of a licence) to kill or injure any wild bird, take, damage or destroy the nest of any wild bird whilst it is in use or being built; take or destroy the egg or any wild bird. Bird species listed on the Schedule 1 of the WCA are afforded additional protection and certain birds are listed as being of conservation concern (see Appendix B7.3).

9.2.43 During the initial survey and Extended Phase 1 Habitat Survey and update surveys, an assessment was made of the habitats on Site for their suitability to support breeding birds.

Dormouse

9.2.44 Dormice are not known to travel far from their nests and are highly arboreal and therefore require woodland or hedgerow habitat with an adequate food supply (i.e. species-rich hedgerows) with good structure, and which are suitably managed. The decline of dormouse is likely to be linked to the decrease of species rich hedgerows, as a result of management practices and as a result of fragmentation of woodland.

9.2.45 Dormice have a varied diet but nuts including hazel *Corylus avellana*, beech *Fagus sylvatica* and chestnuts are a particularly important food source before hibernation.

9.2.46 During the initial survey and the Extended Phase 1 Habitat Survey and update surveys, an assessment was made of the habitats on Site for their suitability to support dormouse.

Reptiles

9.2.47 Grass snakes (*Natrix natrix*) are most commonly associated with wet habitats such as ponds, lakes, marshes, streams, ditches and rivers and have a diet consisting almost entirely of amphibians. The adder (*Vipera berus*) and slow worm (*Anguis fragilis*) are typically associated with drier, heathland habitat and the common lizard (*Zootoca vivipara*) is found in a wide range of habitats. The smooth snake (*Coronella austriac*a) and sand lizard (*Lacerta agilis*) are found in similar habitats, typically mature heathland. All these species are “cold blooded”, and need to bask in sunlight; such basking opportunities are readily found on south-facing slopes.

9.2.48 Smooth snake populations in the UK are limited to lowland heath in Hampshire, Devon, Dorset and Surrey. A large proportion of the sand lizard population can also be found in these areas but there are also some smaller populations in the Weald and Thames Basin heath lands and they can be found on sand dunes in Merseyside, Wales and south-east England. During the initial survey and the Extended Phase 1 Habitat Surveys, an assessment was made of the habitats on Site for their suitability to support the more common reptile species.

White-letter hairstreak

9.2.49 The white-letter hairstreak *Satyrium w-album* is a UK BAP priority species. There are three historic records of white-letter hairstreak along the Salt Way (Grid Reference SP453387).

9.2.50 In April 2013 Cherwell District Council's Ecologist suggested that surveys for this species, as well as for other butterfly interest, should be undertaken at the Site and along the Salt Way and the potential impacts upon this species assessed.

9.2.51 White-letter hairstreak are reliant on elm species (wych elm *Ulmus glabra* is favoured) which is the sole food-plant of their larvae. Colonies of this species are small and can be focussed on a small group of trees or an individual tree. Flowering elms are required for successful larval development as the larvae move to and feed on flower buds immediately after they hatch. Therefore the potential presence of white-letter hairstreak on Site can be determined from the presence of flowering elm species on the Site.

9.2.52 A survey was undertaken on 21st May 2013 to map the occurrence of elm within the Site, although it is recognised that the survey was undertaken outside the optimum time of year to record flowering elm species as elms usually flower in February and March. However as a precautionary approach all elm species were recorded within the Site, as abundant foliage enabled identifying the presence of elm species even though they weren't in flower. The location of elm species was also noted during the additional update survey conducted in July 2014.

9.2.53 Regarding other butterfly interest at the Site, the assessment was based on habitat data and incidental sightings of butterflies observed on Site. Small whites *Pieris* sp. and peacock *Inachis io* butterflies were observed along the hedgerow adjacent to the Salt Way. The Site is primarily arable land which is assessed as being of negligible value to butterflies and other invertebrates. The field margins in the arable fields were either non-existent or narrow. The hedgerows would represent the most suitable habitat for butterflies on Site, which could support some other common species such as gatekeeper *Pyronia tithonus* or small tortoiseshell *Aglais urticae*, however the spray drift from fertilisers and pesticides used on the arable fields are considered likely to negatively affect the populations and diversity of butterflies that may be present in the hedgerows.

9.2.54 It is considered highly unlikely that the habitats to be significantly affected by the development, i.e. loss of 14% of the total hedgerows present on Site, will give rise to significant adverse impacts on these species and, given the above assessment, specific surveys for butterflies were therefore not undertaken.

9.2.55 The conclusions of the assessment set out above were agreed by Cherwell District's Council's Ecology Officer (see Appendix 9.7).

Nature Conservation Evaluation and Significance Criteria

9.2.56 The assessment of the nature conservation value of the survey area has been based on the initial survey undertaken by Halcrow, the Extended Phase 1 Habitat Survey carried out in 2012 and the update surveys undertaken in 2014 by Wardell Armstrong LLP and the widely applied criteria described in *'A Nature Conservation Review'* (Ratcliffe, 1977)[7]. A summary of these criteria is set out in Appendix 9.9.

9.2.53 The magnitude of each predicted impact has been assessed on a scale of Large, Moderate, Small or Negligible as set out in Table 9.1.

Table 9.1. Criteria for determining magnitude of impacts and significance

Magnitude	Criteria
Large (adverse/beneficial)	Loss of or permanent damage or significant enhancement to any part of a nationally important site, or a substantial part or key feature of a site of county importance, or the whole of a site of local importance. Loss or gain of a legally protected, nationally rare or nationally scarce species from the site or its immediate vicinity.
Moderate (adverse/beneficial)	Loss of or permanent damage or enhancement to any part of a site of county importance, or a substantial part or key feature of a site of local importance. A substantial reduction or gain in the numbers of legally protected, nationally rare, nationally scarce species on the site or its immediate vicinity. The loss of, or very substantial reduction or substantial gain in the population of, a rare species (regional/county level) from the site or its immediate vicinity.
Small(adverse/beneficial)	Loss of or permanent damage to or enhancement any part of a site of local importance. A reduction in the population of legally protected or gain in nationally rare, nationally scarce or rare (regional/county level) species on the site or its immediate vicinity.
Negligible	Temporary damage to a small part of a site of local importance or loss of or damage to land of negligible nature conservation value. No reduction or gain in the population of legally protected, nationally rare, nationally scarce or notable (regional/county level)

[7] Ratcliffe, D.A. (1977). *A Nature Conservation Review*. Cambridge University Press, Cambridge.

	species on the site or its immediate vicinity.

9.2.57 The nature conservation value of an area of land is usually assessed in terms of international, national, regional/county, district, local (parish) and negligible value. Examples of sites and their nature conservation value are outlined in Table 9.2 below:

Table 9.2. Nature Conservation Value and Sensitivity

Value	Sensitivity	Examples
International	High	Special Areas of Conservation, Special Protection Areas, Ramsar Sites
National	High	Sites of Special Scientific Interest (SSSIs), or non-designated sites meeting SSSI selection criteria, National Nature Reserves (NNRs), Nature Conservancy Review (NCR) Grade 1 sites
Regional/County	Medium	Local Nature Reserves, Sites of Importance for Nature Conservation, Ancient Woodlands, Sites containing viable areas of any key habitat type identified in the Local Biodiversity Action Plan (LBAP).
District or Local (parish) value	Medium	Significant ecological features such as old hedges, mature and semi-mature woodlands and ponds
Neighbourhood value	Low	Value within the context of the survey area (e.g. small areas of semi-improved grassland, isolated mature trees).
Negligible	Negligible	Usually applied to areas of built development, active mineral extraction, intensive agricultural land or areas with invasive non-native species.

9.2.54 Species are evaluated based on their rarity, population size and whether they are especially important to the functioning of an ecosystem. Though they may not be protected or particularly rare, consideration is also given to those species listed in the UKBAP as well as the Oxfordshire Local BAP.

9.2.55 The assessment of the impacts of the Proposed Development needs to take into account both on-site impacts as well as those which may affect adjacent areas of nature conservation value. Impacts can be permanent or temporary and can include:

- Direct loss of wildlife habitats;
- Fragmentation and isolation of habitats;

- Disturbance to species;
- Changes to the local hydrology and/or water quality.

9.2.56 The significance of an adverse impact (or a beneficial result) is the product of the magnitude of the impact and the value or sensitivity of the nature conservation resources affected. There is no agreed method for assessing the significance of adverse impacts on nature conservation receptors. Nevertheless, high levels of significance will generally be ascribed to large impacts on receptors of high nature conservation value. Low levels of significance will generally be ascribed to small impacts on receptors of high nature conservation value or large impacts on receptors of low or negligible nature conservation value.

Uncertainties and limitations

9.2.57 The ecological surveys were not intended to produce a comprehensive list of plants or animals for the habitats as any ecological survey is limited by factors which affect the presence of plants and animals such as time of year, migration patterns and behaviour.

9.2.58 However, the results of the surveys allow an assessment of significance of the potential impacts from the Proposed Development and consideration of appropriate mitigation measures.

9.2.59 Access was not granted by the landowner to survey Pond P6 and therefore this pond could not be surveyed for amphibians. However, paragraph 9.2.20 states that the pond is heavily shaded and may be dry and therefore is considered to have low potential to support GNCs.

9.2.60 Vegetation may have obscured badger signs during both the 2012 and 2014 surveys.

9.3 RELEVANT POLICY

National Planning Policy Framework (March 2012)

9.3.1 The National Planning Policy Framework (NPPF) is a material consideration for the purposes of planning decision making. The National Planning Policy Framework is clear that pursuing sustainable development includes moving from a net loss of biodiversity to achieving net gains for nature (para 109), and that a core principle for planning is that it should contribute to conserving and enhancing the natural environment (para 113, 114, 117 and 118) and reducing pollution (paras 110 and 120).

National Planning Practice Guidance

9.3.2 The National Planning Practice Guidance (NPPG) provides information on the implementation of the policies set out within the NPPF and how these policies are associated with supporting legislation, policies and supplementary guidelines.

9.3.3 With regard to Schedule 2 projects, the NPPG explains the requirements of Town and Country Planning (EIA) Regulations 2011, including the legislation, stages and implementation of the act.

Extracts

"Section 40 of the Natural Environment and Rural Communities Act 2006, places a duty on all public authorities in England and Wales to have regard, in the exercise of their functions, to the purpose of conserving biodiversity. A key purpose of this duty is to embed consideration of biodiversity as an integral part of policy and decision making throughout the public sector, which should be seeking to make a significant contribution to the achievement of the commitments made by Government in its Biodiversity 2020 strategy".

"Guidance on statutory obligations concerning designated sites and protected species is published separately …. Local planning authorities should take a pragmatic approach – the aim should be to fulfil statutory obligations in a way that minimises delays and burdens"

Cherwell District Local Plan (1996)

9.3.4 Saved Policy C1 of the Cherwell Local Plan provides protection from development to all designated sites of importance for nature conservation including statutory and non-statutory sites.

> *"The Council will seek to promote the interests of nature conservation. Development which would result in damage to or loss of sites of special scientific interest or other areas of designated wildlife or scientific importance will not normally be permitted. Furthermore, the council will seek to ensure the protection of sites of local nature conservation value. The potential adverse affect of development on such sites will be a material consideration in determining planning applications."*

9.3.5 Saved Policy C2 of the Local Plan provides protection from development on wildlife species already protected by legislation.

> *"Development which would adversely affect any species protected by Schedule 1, Schedule 5 and Schedule 8 of the 1981 Wildlife and Countryside Act, and by the E.C. Habitats Directive 1992 will not normally be permitted."*

9.3.6 Saved Policy C4 deals with the creation of new habitats as part of any developments.

> *"The Council will seek to promote the creation of new habitats. In urban areas the council will promote the interests of nature conservation within the context of new development and will establish or assist with the establishment of ecological and nature conservation areas, where such areas would further the opportunity for environmental education and passive recreation and would not conflict with other policies in the plan."*

9.3.7 Saved Policy C5 is also relevant to the development and gives protection to the Saltway which is adjacent to the northern boundary of the Site.

> *"The Council will seek to protect the ecological value and rural character of the following through the control of development:*
> *(i) The Oxford Canal and River Cherwell;*
> *(ii) The flood plain of the River Cherwell;*
> *(iii) Saltway, Banbury;*
> *(iv) The mineral-railway footpath route and geological site of special scientific interest, Banbury;*

(v) The urban woodlands to the south of St.Louis meadow, at Grimsbury Green and to the north of Grimsbury Reservoir, Banbury;

(vi) Otmoor and the flood plain of the River Ray."

The Non-Statutory Cherwell District Local Plan 2011 (2004)

9.3.8 The Non Statutory Cherwell Local Plan 2011 was intended to review and update the local plan adopted in 1996. Due to changes introduced in the planning system, work on the plan was discontinued prior to adoption. The Non Statutory Local Plan 2011 is not part of the statutory development plan but has been approved as interim planning policy for development control purposes.

9.3.9 Policy EN1 seeks to protect the environment from any adverse impacts that could potentially be caused by proposed developments.

EN1 - In determining planning applications the council will take into account the likely impact of a proposal on the natural and built environment and will seek to enhance the environment wherever possible. Development which would have an unacceptable environmental impact will not be permitted.

9.3.10 Policy EN22 and EN24 look to protect and enhance, where possible, areas with nature conservation value or provide compensatory measures where appropriate.

EN22 – Development proposals will be expected to incorporate features of nature conservation value within the site. Features of value should be retained and enhanced wherever possible. The use of planning conditions or planning obligations will be sought to secure their protection and management, or the provision of compensatory measures where appropriate.

EN24 – The council will seek to promote the interests of nature through the control of development. Proposals which would result in damage to or loss of a site of ecological or geological value will not be permitted unless:

(i) In the case of an internationally important site, there is no alternative solution and there are imperative reasons of over-riding public interest for the development; or

(ii) In the case of a nationally important site, the reasons for the development clearly outweigh the ecological or geological value of the site and the national policy to safeguard the national network of such sites; or

(iii) In the case of a site of regional or local importance for its ecological or geological value, the reasons for the development clearly outweigh the ecological value of the site.

In all cases where the development is permitted, damage must be kept to a minimum. The council will use conditions or planning obligations to protect and enhance the site's ecological or geological interest and to provide mitigation and compensatory measures where appropriate.

9.3.11 Policy EN25 provides protection from development to wildlife species already protected by legislation.

EN25 – Development which would adversely affect any species protected by schedule 1, schedule 5 and schedule 8 of the 1981 Wildlife and Countryside act, and by the E.C Habitats Directive 1992, or its habitats will not be permitted

9.3.12 EN27 deals with the creation of new habitats as part of any developments.

EN27 – Development proposals should incorporate the creation of new habitats, particularly those concerning priority habitats or species wherever possible. The council will promote the interest of nature conservation areas, where such areas would further the opportunity for environmental education and passive recreation.

Draft Cherwell Local Plan 2006 - 2031(2014)

9.3.13 The Draft Cherwell Local Plan (2006-2031) was submitted to the Secretary of State for Communities and Local Government for formal Examination on 31st January 2014. The public examination hearings into the Submission Local Plan were suspended on 4 June 2014 for six months to enable the Council to put forward proposed modifications to the Plan.

9.3.14 Policy ESD *'Protection and enhancement of biodiversity and the natural environment'* seeks to protect the environment from any adverse impacts that could potentially be caused by proposed developments. The policy states several methods to achieve this. Methods relevant to this development are stated below:

- *In considering proposals for development, a net gain in biodiversity will be sought by protecting, managing, enhancing and extending existing resources, and by creating new resources;*
- *The protection of trees will be encouraged, with an aim to increase the number of trees in the district;*
- *The reuse of soils will be sought;*
- *Development which would result in damage to or loss of a site of biodiversity or geological value of national importance will not be permitted unless the benefits of the development clearly outweigh the harm it would cause to the site and the wider national network of SSSIs, and the loss can be mitigated to achieve a net gain in biodiversity/geodiversity;*
- *Development which would result in damage to or loss of a site of biodiversity or geological value of regional or local importance including habitats of species of principal importance for biodiversity will not be permitted unless the benefits clearly outweigh the harm it would cause to the site, and the loss can be mitigated to achieve a net gain in biodiversity/geodiversity; and*
- *Development proposals will be expected to incorporate features to encourage biodiversity, and retain and where possible enhance existing features of nature conservation value within the site. Existing ecological networks should be identified and maintained to avoid habitat fragmentation, and ecological corridors should form an essential component of green infrastructure provision in association with new development to ensure habitat connectivity.*

9.4 BASELINE CONDITIONS

9.4.1 This section describes the baseline conditions of the Site and provides information gathered as a result of enquiries and survey information.

Information received from Enquiries

9.4.2 Information was received from Thames Valley Environmental Records Centre (TVERC). The Multi-Agency Geographic Information for the Countryside (MAGIC) and Natural England's 'Nature on the Map' websites were utilised to gather data.

9.4.3 The location of all statutory and non-statutory nature conservation designations are shown on the plan provided by TVERC (Appendix 9.8).

Statutory Nature Conservation Designations

9.4.4 Information received from MAGIC and TVERC has revealed that there are no statutory designations within 2km of the Site.

Non-Statutory Nature Conservation Designations

Local Wildlife Sites (LWS)

9.4.5 Information received from Cherwell District Council and TVERC has revealed the presence of one potential Local Wildlife Site (pLWS) and one Local Wildlife Site (LWS) within 2km of the development Site. The Bretch LWS is situated approximately 1.2km to the north-west of the Site. It covers an area of 2.3ha and comprises an abandoned ironstone working, which is now used as a picnic area. Steep spoil heaps support a varied grassland flora with pockets of richer neutral and calcareous grassland amongst rough neutral grassland. The LWS supports a range of butterflies including ringlet *Aphantopus hyperantus* and marbled white *Melanargia galathea*.

9.4.6 The records received from Thames Valley Environmental Records Centre did not provide any information on the potential Salt Way LWS. It is understood from Cherwell District Council that it may be designated in the future for its wildlife value and its value as a "green lane".

9.4.7 The proposed LWS is the Salt Way from Broughton Road near Bretch LWS to the junction with bridleway 45 (near Grange Road). Therefore approximately half of the potential LWS defines much of the northern Site boundary of the Proposed Development. It is a surfaced path lined either side with a wide strip of mature tree line/hedgerow and scrub.

UKBAP Habitats

9.4.8 Information obtained from Natural England's 'Nature on the Map' has shown there are a number of areas of two types of UKBAP habitats within 2km of the Site. There are seven areas located within 2km of the Site that are listed on the traditional orchard inventory for England. The closest area is located approximately 0.4km to the east of the Site.

9.4.9 Additionally, there are two areas of floodplain grazing marsh within 2km of the Site. The closest is located approximately 0.8km to the south of the Site whereas the second is situated approximately 1.7km to the east of the Site.

Local BAP Habitats and Species

9.4.10 A review of the Oxfordshire Local Biodiversity Action Plan (LBAP) highlights the habitats that are potentially relevant to the Proposed Development Site as shown in Table 9.3. The Oxfordshire LBAP also lists a number of priority species. The priority species potentially relevant to this Site have also been identified in Table 9.3.

Table 9.3 – Oxfordshire Local Biodiversity Action Plan Potentially Relevant Habitats and Species

Habitats	
Arable and Horticulture	
Arable Field Margins	
Hedgerows	
Species	
Common Name	***Scientific Name***
Common swift	*Apus apus*
Swallow	*Hirundo rustica*
Dormouse	*Muscardinus avellanarius*
Barn Owl	*Tyto alba*
Lapwing	*Vanellus vanellus*

Protected Species

Flora

Protected / Notable Species

9.4.11 TVERC holds a record for bluebell *Hyacinthoides non-scripta*, which is listed on Schedule 8 of the Wildlife and Countryside Act 1981, within 2km of the Site. Additionally, TVERC holds a record for corn buttercup *Ranunculus arvensis*, a UKBAP species, within 2km of the Site. Neither of these records is located on Site.

Invasive Species

9.4.12 TVERC holds no records for invasive species within 2km of the Site.

Fauna

Amphibians

9.4.13 TVERC holds a number of records of smooth newt *Lissotriton vulgaris* within 2km of the Site. The closest records are located approximately 1.0km to the south-east of the Site. TVERC holds two records for common toad *Bufo bufo* of which the closest record (a historic record from 1988) is located approximately 0.7km to the south of the Site. Additionally, TVERC holds a number of records for common frog *Rana temporaria* of which the closest is situated approximately 0.8km to the south-east of the Site. TVERC holds no records for great crested newts within 2km of the Site.

Badgers

9.4.14 All information relating to badgers has been provided within the confidential Badger Report (Appendix 9.4) and is not for general public release.

Bats

9.4.15 TVERC holds three records for common pipistrelle *Pipistrellus pipistrellus* and two records for unidentified pipistrelle bat *Pipistrellus* sp. within 2km of the Site. The closest record is situated approximately 0.3km to the north of the Site.

Birds

9.4.16 TVERC holds records of numerous bird species which occur within 2km of the Site. However, TVERC holds no records of species listed under Schedule 1 of the Wildlife and Countryside Act 1981 (as amended) (W&C 1981) within 2km of the Site.

9.4.17 Bird species which are protected, listed as UKBAP priority species and/or priority species in England (under the NERC Act Section 41) and / or listed on the RSPB's red or amber list of species of conservation concern which TVERC had records for within 2km of the Site are summarised in Table 9.4.

Table 9.4 – Birds species records* within 2km of Site

Bird Species	Protection	UKBAP priority species/Priority Species in England	Red / Amber list of birds of high / medium conservation concern
Swift (*Apus apus*)			Amber
House sparrow *(Passer domesticus)*		UKBAP	Red
Tree sparrow (*Passer montanus)*		UKBAP	Red
European golden plover *(Pluvialis apricaria)*			Amber
Bullfinch *(Pyrrhula pyrrhula)*		UKBAP	Amber
Starling *(Strunus vulgaris)*		UKBAP	Red
Song thrush *(Turdus philomelos)*		UKBAP	Red

**records sourced from TVERC records*

Brown Hare (*Lepus europaeus*)

9.4.18 TVERC holds one record of brown hare situated approximately 1.2km to the west of the Site.

Dormouse

9.4.19 TVERC holds no records for dormice within 2km of the Site.

Hedgehog (*Erinaceus europaeus*)

9.4.20 TVERC holds a record of hedgehog located approximately 1.0km to the south-east of the Site.

Invertebrates

9.4.21 Information received from TVERC has revealed historic records (pre-1995) of four UKBAP invertebrate species within 2km of the Site. These include records of white-letter hairstreak which are located along the Salt Way along the northern boundary of the Site. Additionally, TVERC holds records for wall *Lasiommata megera*, small heath butterfly *Coenonympha pamphilus* and shaded broad-bar *Scotopteryx chenopodiata* all of which are not located on or directly adjacent to the Site.

Otter

9.4.22 TVERC holds no records for otter within 2km of the Site.

Reptiles

9.4.23 TVERC holds six records for grass snake *Natrix natrix* located within 2km of the Site. The closest record is situated approximately 0.8km to the south-east of the Site.

Water vole

9.4.24 TVERC holds two historic records (from 1988) of water vole within 2km of the Site. The closest of which is located approximately 1.1km to the south of the Site.

White-clawed crayfish (*Austropotamobius pallipes*)

9.4.25 TVERC holds one historic record (from 1979) for white-clawed crayfish within 2km of the Site. The record is located approximately 1.2km to the south of the Site.

Other Species

9.4.26 TVERC holds two records for polecat *Mustela putorius*, a UKBAP species, within 2km of the Site. The closest record is situated approximately 0.9km to the south-west of the Site.

Results of Extended Phase 1 Habitat Survey

Description of Habitats

Arable fields

9.4.27 The Site mainly comprises arable fields which at the time of the surveys in 2012 and 2014 were under arable crop. The field margins vary from virtually non-existent to narrow (around 0.25m to around 1.5m wide). The majority of the margins are dominated by common nettle *Urtica dioica* with hedge bindweed *Catystegia sepium* and yellow oat grass *Trisetum flavescens*.

Hedgerows

9.4.28 The Site contains eleven hedgerows ranging from defunct species poor hedgerows to intact species rich hedgerows. The species composition of each hedgerow varies and a description of each hedgerow is provided in the target notes attached in Appendix 9.1. Species generally present in most hedgerows within the Site include hawthorn *Crataegus monogyna*, blackthorn *Prunus spinosa* and elder *Sambucus nigra*. Half of the hedgerows contained five or more woody species along their length.

9.4.29 Bramble *Rubus fructicosus agg*. and dog-rose *Rosa canina* are frequently found within the hedgerows and common nettle and ground ivy *Glechoma hederacea* are frequently found within the ground flora. Other species commonly noted in the ground flora were hogweed *Heracleum sphondylium*, ivy *Hedera helix*, cleavers *Galium aparine* and lords and ladies *Arum maculatum*.

9.4.30 Six hedgerows are considered to have the potential to be deemed 'important' under the wildlife and landscape criteria of the Hedgerow Regulations 1997. Appendix 9.3 details the results of the application of the criteria to determine the potential for 'important' hedgerows. The six hedgerows are target noted as H1, H2, H4, H12, H15 and H16 on the habitat plan (Drawing CA10769-9.1).

Mature/Semi mature trees

9.4.31 Numerous hedgerows have semi-mature or mature trees associated with them, which have been described in the target notes (Appendix 9.1). Hedgerow H1 along the northern boundary includes a number of mature trees as does Hedgerow H12 along the western boundary of the Site. Species include ash *Fraxinus excelsior*, pedunculate oak *Quercus robur*, sycamore *Acer psuedoplatanus* and lime *Tilia x europea*. Due to the large number of mature trees they have not been mapped separately on the habitat plan, but are fully referenced within the Arboricultural Assessment.

Broad-leaved Woodland / Mixed Plantation

9.4.32 A small area of semi-natural mixed woodland is located in the north-western corner of the Site. Additionally, a narrow strip of mixed woodland plantation is located along the southern boundary of the Site. A small stand of Douglas Fir *Picea abies* is located to the east of the track leading to Wykham Park Farm Cottage (Target note 1).

9.4.33 A narrow strip of young mixed woodland plantation is also located along the footpath and bridleway leading to Wykham Farm Cottage (Target note 2). The majority of these trees comprise stems of less than 20cm in diameter. A ditch and bank are located along the centre of the plantation between the bridleway and footpath. Species present within the plantation include frequent hawthorn and field maple *Acer campestre* with occasionally occurring silver birch *Betula pendula,* rose species *Rosa sp.,* blackthorn and Scots pine *Pinus sylvestris*.

Ponds / Watercourse

9.4.34 At the time of the Extended Phase 1 Habitat survey and update survey, there were no waterbodies present on Site and the watercourse shown on OS maps to be located along the southern boundary of the Site was dry. No aquatic species were present to indicate that the ditch had recently held water.

9.4.35 From a review of a 1:10,000 OS map in 2012, six waterbodies were identified within 500m of the Site (referred to as Ponds P1 – P6). The Site boundary of the Proposed Development, by virtue of its eastern extent, brings a reservoir (P7) within 500m of the Site boundary, but beyond 500m of the any proposed built footprint. The locations of these ponds are shown on Drawing Number CA10769/9.10 in Appendix 9.12.

Protected Species

Flora

Protected/Notable Species

9.4.36 The initial survey undertaken by Halcrow reported no findings of legally protected rare or scarce flora species on Site. Halcrow did not identify any vascular plant species recorded in the habitats within the survey area which are Red Data book species (British Red Data Book 1: Vascular Plants, Wiggington, 1999[8]) or nationally scarce species (Scarce Plants in Britain, Stewart et al, 1994[9]). During the Extended Phase 1 Habitat Survey and update surveys undertaken by Wardell Armstrong LLP, no legally protected rare or scare flora species were observed.

Invasive Species

9.4.37 The initial survey undertaken by Halcrow did not report any invasive species, as listed in the Wildlife and Countryside Act 1981 (as amended) Schedule 9, Section 14 i.e. Japanese knotweed *Fallopia japonica* or Indian balsam *Impatiens glandulifera* within the Site. No invasive species were observed during the Extended Phase 1

[8] Wigginton, (1999). *British Red Data Book 1: Vascular Plants*. Joint Nature Conservation Committee, Peterborough.

[9] Stewart, A. Pearman, D.A. & Preston, C.D. (eds). (1994). *Scarce Plants in Britain*. Joint Nature Conservation Committee, Peterborough.

Habitat Survey in 2012 and update surveys in 2014 undertaken by Wardell Armstrong LLPand are not considered further in this report.

Fauna

Amphibians

9.4.38 During the Extended Phase 1 Habitat Survey in August 2012 and update habitat surveys of the Site in April, July and August 2014, by Wardell Armstrong LLP, habitats that could potentially provide terrestrial habitat for amphibians were identified. It is considered that the most valuable habitats for amphibians are the woodland and hedgerows within the Site.

9.4.39 Seven waterbodies were identified within 500m of the Site (referred to as Ponds P1 – P7). The locations of these ponds are shown on Drawing Number CA10769/9.10 in Appendix 9.12. A summary of the waterbodies identified is provided in Table 9.5:

Table 9.5 – Water body /Course Description and HSI Score

Pond / Stream Reference	**Pond Access and Status**	**HSI Score/Pond Suitability**
P1	Surrounded by trees and scrub	0.66 – Average
P2	Very small pond heavily shaded	0.28 – Poor
P3	Small pond at corner of field boundary with no aquatic vegetation – connected to hedges/trees	0.49 – Poor
P4	Small woodland pond feeding into an underground watercourse	0.41 – Poor
P5	School pond surrounded by lawns and amenity planting but nearby fields	0.79 – Good
P6	No Access Available	No score assigned
P7 -	(Scoped in August 2014) – Reservoir with	0.75 - Good

Reservoir	marginal vegetation along eastern side	

9.4.40 The ponds P1 to P5 were subject to further surveys and the results are summarised in Table 9.6 below:

Table 9.6: GCN survey results for suitable ponds within 500m

Pond Number	Methods Employed	GCNs Present	Population Size Class (Peak Count)
Pond P1	Bottle-trapping; Torchlight; Egg-search	Y	Medium (34 – 20.05.13)
Pond P2	Torchlight	N	-
Pond P3	Bottle-trapping	N	-
Pond P4	Torchlight	N	-
Pond P5	Torchlight, Egg-search	Y Eggs found	Medium (30 – 20.05.13)
Pond P6	-	Not surveyed	-
Reservoir	-	Not surveyed	-

9.4.41 Pond P2 and Pond P4 were too shallow to use bottle-traps. No suitable aquatic vegetation to egg-search was present in Ponds P2, P3 and P4. Pond P5 was lined and therefore bottle-traps could not be used. Pond P3 was very turbid and therefore only bottle-trapping was employed at this pond. The egg-search in Pond P1 was limited as most of the vegetation in the pond comprised reeds *Phragmites* sp.

9.4.42 Smooth newts, common frog and fish were observed in Pond P1. No amphibians were observed in Ponds P2, P3 and P4. Smooth and palmate newts *Triturus helveticus*, common frog and dragonfly larvae were observed in Pond P5.

Badgers

9.4.43 All information relating to badgers has been provided within the confidential Appendix 9.4 and is not for general public release.

Bats

9.4.44 The initial survey undertaken by Halcrow recommended detailed surveys for bats. During this survey, Halcrow identified the following trees with the potential to provide suitable roosting habitat for bats:

- A mature ash tree located in woodland adjacent to the Salt Way comprising a woodpecker hole and a trunk covered in dense ivy;
- Two ivy clad mature ash trees in the hedgerow located to the north of Georges Barn; and
- A line of trees outside and adjacent to the western Site boundary.

9.4.45 Therefore, emergence and dawn re-entry surveys were undertaken at these trees in August and September 2012. Additionally, activity surveys were undertaken across the Site to determine bat foraging and commuting routes across the Site.

2012 Surveys

August Dusk Surveys

9.4.46 The bat surveys were undertaken over three consecutive nights on 14th, 15th and 16th August 2012; the weather conditions at the time of the surveys are provided in Table 9.7 below. The transects walked and the mature trees observed during the August surveys are shown on Drawing CA10769-/9.2 (page 1). The results of the dusk surveys are shown on Drawing CA10769-9.4 (drawings within Appendix 9.12). The surveys in 2012 covered a wider survey area than the 2014 application area.

Table B9.7 – Weather Conditions for August Dusk Surveys

Date	Weather Conditions	Wind	Cloud Cover	Temperature	Start/End time
14/08/12	Warm and dry	Light breeze	4	16	20:05/23:10
15/08/12	Cool and dry after heavy rain	Light breeze	1	16	20:06/22:52
16/08/12	Fine and dry	Very little breeze	6	15	20:05/22:45

9.4.47 On 14th August 2012 five common pipistrelles were observed emerging from the mature ash tree located along the Salt Way at 20:45. Following this, common and soprano pipistrelles *Pipistrellus pygmaeus* were observed to be foraging and commuting up and down the Salt Way. During the emergence survey common and soprano pisitrelles were also observed to be foraging and commuting within the field and a noctule bat *Nyctalus noctula* was observed to be foraging and commuting along the field side of the Salt Way.

9.4.48 The dusk activity survey on 14th August 2012 continued on from the emergence survey at 21:35 and followed Transect 1. Common and soprano pipistrelles were observed to be foraging and commuting along the majority of the transect in particular along the southern Site boundary near the dry watercourse.

9.4.49 On 15th August 2012 the first bat calls during the emergence survey were not recorded until 21:01. Common pipistrelles were heard first and following this there were multiple common pipistrelle passes and feeding activity. A few soprano pipistrelle passes were also recorded commuting along a hedgerow (north of Wykham Farm Cottage located to the east of the Site).

9.4.50 The dusk activity survey on 15th August 2012 continued on from the emergence survey at 21:40 and followed Transect 2. Common pipistrelles were observed to be commuting along the northern boundary of Wykham Farm Cottage as well as along the path leading up to the Salt Way. Soprano pipistrelle passes were also heard along the Salt Way along with a fewer common pipistrelle passes.

9.4.51 On 16th August 2012 the emergence survey was commenced at 20:05. The first bat calls were common pipistrelles and were detected at 20:49. Following this, further faint common and soprano pipistrelle passes were heard throughout the emergence survey including feeding. Additionally, a possible noctule bat was heard at 21:08 and a possible myotis bat species (*Myotis* sp.) pass was heard at 21:09.

9.4.52 The dusk activity survey on 16th August 2012 continued on from the emergence survey at 21:28 and followed Transect 3. Numerous common pipistrelle and soprano pipistrelle passes were heard along the western boundary of the Site. Common and soprano pipistrelles were observed feeding along the central hedgerow (Target note H16). A few common pipistrelle passes were heard along the remaining transect.

Additionally, a lot of feeding activity by both common and soprano pipistrelles was observed around the woodland just outside the north-west boundary of the Site.

9.4.53 In addition a number of bats were observed on all three nights with peak frequency calls between 48 and 52khz. These are pipistrelle bats, but the species could not be determined from the sound analysis results.

August Dawn Surveys

9.4.54 The dawn surveys were undertaken over three consecutive mornings 15th, 16th and 17th August 2012; the weather conditions are provided in Table 9.8 below. The transects walked and the mature trees observed during the August surveys are shown on Drawing CA10769-9.2 (page 2). The results of the dawn surveys are shown on Drawing CA10769-9.5 (drawings within Appendix 9.12).

Table 9.8 – Weather Conditions for August Dawn Surveys

Date	Weather Conditions	Wind	Cloud Cover	Temperature	Start/End time
15/08/12	Clear and fine	Slight breeze	3	18	04:12/06:13
16/08/12	Fine rain clearing to be dry and fine	Light breeze	6	16	04:15/06:06
17/08/12	Clear and dry	Light breeze with stronger gusts	7	17	04:10/06:05

9.4.55 On 15th August the dawn activity survey followed Transect 1. Two common pipistrelles were observed foraging from the start of the survey along hedgerow H2. Common pipistrelle calls were heard along the southern boundary and Hedgerow H16 and one soprano pipistrelle was detected along the southern boundary.

9.4.56 The dawn re-entry survey commenced at 04.59. At the mature ash tree from 04.59 onwards two common pipistrelles were observed to be foraging up and down the path. A soprano pipistrelle pass was also detected. At 05:16 two common pipistrelle bats were observed to enter the mature tree. Further common pipistrelle bats were observed to be feeding and circling around the tree and along the path. At 05:19 a third common pipistrelle was observed entering the tree and a fourth individual entered the tree at 05:20. No further bats were observed entering the tree.

9.4.57 On 16th August the dawn activity survey followed Transect 2. Common and soprano pipistrelles were observed from the start of the survey to be feeding along hedgerow H3. Further common and soprano pipistrelle passes and feeding activity was observed along the remaining transect route including along the Salt Way, the bridle path within the plantation and the hedgerow located at eastern boundary of the 2012 survey area.

9.4.58 The dawn re-entry survey commenced at 5:06. A faint common pipistrelle pass was heard at the start and at 05:08 near the mature ash tree but no bats were seen entering the tree. No further bats were detected or observed.

9.4.59 On 17th August the dawn activity survey was commenced at 04:10 and followed Transect 3. Numerous common pipistrelle passes and feeding activity was observed from the start of the survey along the Salt Way track. A minimum of two individuals were observed. Further common pipistrelle passes were heard along the northern Site boundary, hedgerows H11, H15 and H16. During the activity survey, a common pipistrelle bat was observed from 05:00 to be swarming around the mature pedunculate oak tree located along the southern Site boundary until 05:04 when it entered the tree.

9.4.60 The dawn re-entry survey was commenced at 05:25. No bats were observed or detected during this survey.

September Dusk Surveys

9.4.61 The bat surveys were undertaken over three consecutive nights 11th, 12th and 13th September 2012; the weather conditions are provided in Table 9.9 below. The results of the September dusk surveys are shown on Drawing CA10769-9.6 (Appendix 9.12). The transects walked and the mature trees observed during the September surveys are shown on Drawing CA10769-9.3 (Appendix 9.12).

Table 9.9 – Weather Conditions for September Dusk Surveys

Date	Weather	Wind	Cloud Cover	Temperature	Start/End time
11/09/12	Cool and dry	Slight breeze and occasional stronger gusts	3	12	19:14
12/09/12	Heavy rain at start but lightened and	Light breeze with occasional	8	11	19:20 (waited for

	had stopped by 19:45	stronger gusts			heavy rain to slow)
13/09/12	Clear and dry	Light breeze	2	12	19:05

9.4.62 On 11th September the emergence survey was commenced at 19:14. The first bat calls were heard at 19:55, these were from common pipistrelles and soprano pipistrelles. From then onwards, common pipistrelle and soprano pipistrelle passes were heard at regular intervals and observed flying between the mature trees from north to south and back. At least two individuals were observed. In addition, one pipistrelle bat was observed entering one of the mature trees indicating a potential night or feeding roost.

9.4.63 The dusk activity survey was commenced at 20:24 and followed Transect 3. Common pipistrelles continued to forage along the western boundary of the Site. Bats were also detected in the north-western corner of the Site to the south of the woodland as well as a single pass along hedgerow H16.

9.4.64 On 12th September at the first mature tree, the first bat calls were detected at 19:44 these were common pipistrelles; however, the common pipistrelles were not seen. At regular intervals onwards a number of short common pipistrelle passes were heard. From 20:01 onwards, numerous, almost continuous, common pipistrelle passes as well as feeding activity and soprano pipistrelle passes were detected. At least two individuals were observed. At 20:39 a common pipistrelle bat pass was heard. At the second mature tree, the first bat calls were heard at 19:43 but the common pipistrelles were not seen. Continuous calls were heard for the remainder of the emergence survey.

9.4.65 The dusk activity survey was commenced at 20:46 and followed Transect 1. Common pipistrelles and soprano pipistrelles were observed to be commuting along the southern boundary of the Site as well as along the Salt Way along the northern boundary and along hedgerow H2.

9.4.66 On 13th September the emergence survey was commenced at 19:05. At the mature ash tree, the first bat pass was detected at 20:00. From 20:03 until 20:26 continuous common pipistrelle and soprano pipistrelle activity including feeding activity was heard and bats were observed foraging along the hedgerow. Following this, a number of individual common pipistrelle passes were heard. At the second mature

ash tree, a single common pipistrelle bat pass was detected at 19:59 and one individual was observed leaving the canopy of the ash tree. Several faint common pipistrelle and soprano pipistrelle bat passes were heard sporadically following this until the end of the emergence survey.

9.4.67 The dusk activity survey was commenced at 20:37 and followed Transect 2. Common pipistrelles and soprano pipistrelles were detected along the path leading from Wykham Farm Cottage to the Salt Way. Additionally, common pipistrelles and soprano pipistrelles were observed feeding along the Salt Way and hedgerow H2.

September Dawn Surveys

9.4.68 The dawn surveys were undertaken over three consecutive mornings 12th, 13th and 14th September 2012; the weather conditions are provided in Table 9.10 below. The results of the dawn surveys are shown on Drawing CA10769-9.7(Appendix 9.12). The transects walked and the mature trees observed during the September surveys are shown on Drawing CA10769-9.3 (Appendix 9.12).

Table 9.10 – Weather Conditions for September Dawn Surveys

Date	Weather Conditions	Wind	Cloud Cover	Temperature	Start/End time
12/09/12	Clear and dry	Light breeze	2	8	05:03
13/09/12	Cool and dry	Light breeze	4	10	05:05
14/09/12	Cool and dry	Occasional gusts	4	15	05:10

9.4.69 On 12th September the dawn activity survey was commenced at 05:03 and followed Transect 3. No bats were detected throughout the survey.

9.4.70 The dawn re-entry survey was commenced at 05:57. A single common pipistrelle bat pass was detected at 05:05. No further bats were observed during the survey.

9.4.71 On 13th September the dawn activity survey was commenced at 05:05 and followed Transect 1. No bats were detected throughout the survey.

9.4.72 The dawn re-entry survey was commenced at 05:50. No bats were detected at either location.

9.4.73 On 14th September the dawn activity survey was commenced at 05:10 and followed Transect 2. Common pipistrelles were observed commuting along the Salt Way track, hedgerow H2 and along the northern boundary of Wykham Farm Cottage.

9.4.74 The dawn re-entry survey was commenced at 05:42. Several individual common pipistrelles were observed commuting and foraging along the northern boundary of Wykham Farm Cottage at the beginning of the survey and some soprano pipistrelles were heard between 05:55 and 06:00; however, no further activity was observed from 06:08.

9.4.75 Paragraph 9.2.40 and appendix 9.5, refers to an agreed approach by Cherwell District Council's ecologist that no update bat surveys are required to supplement those carried out in 2012.

Birds

9.4.76 The hedgerows, mature trees and broad-leaved woodland have the potential to support a variety of tree nesting birds. The arable fields have the potential to support ground-nesting birds. During the Extended Phase 1 Habitat Surveys undertaken by Wardell Armstrong LLP, the following incidental bird sightings were recorded: kestrel *Falco tinnunculus*, woodpigeon *Columba palumbus* and chaffinch *Fringilla coelebs*.

Brown Hare

9.4.77 No brown hares were observed during the Extended Phase 1 Habitat Survey and update surveys undertaken by Wardell Armstrong LLP. However, the arable fields could provide suitable habitat for brown hares within the Site.

Dormouse

9.4.78 Dormice have a varied diet but nuts including hazel, beech and chestnuts are particularly important food sources before hibernation. Other important species include honeysuckle and bramble. Halcrow did not consider dormice to be a constraint to the development and therefore no dormouse surveys were recommended following the initial survey. Additionally, TVERC holds no records of dormice within 2km of the Site. Extensive woodland and hedgerows with a range of food plants that are suitable for dormice were not recorded during the Extended Phase 1 Habitat Survey and update surveys.

Hedgehog

9.4.79 No evidence of hedgehogs was observed during the Extended Phase 1 Habitat Survey or update surveys undertaken by Wardell Armstrong LLP. However, the

hedgerows and woodland located on Site have the potential to provide suitable resting and foraging habitat for hedgehogs.

Invertebrates

9.4.80 The arable fields are unlikely to support a notable assemblage of invertebrates. The hedgerows and broad-leaved woodland offer the most value for invertebrates within the Site. During the Extended Phase 1 Habitat Survey undertaken by Wardell Armstrong LLP in 2012, small white and peacock butterflies were observed on Site.

Reptiles

9.4.81 Halcrow did not consider reptiles to be a constraint to the development and therefore no reptile surveys were recommended following the initial survey. During the Extended Phase 1 Habitat Survey undertaken by Wardell Armstrong LLP in August 2012, a grass snake was observed along the northern boundary of the Site by the Salt Way. This location is close to residential gardens and parkland which are likely to provide more suitable habitat for grass snake than the habitats on Site.

9.4.82 A presence / absence survey for reptiles was not considered necessary, as the presence of grass snakes has been confirmed due to this incidental sighting. From the habitats present on Site, it is considered highly likely that reptiles are limited to the hedgerows and field margins only as a large proportion of the Site comprises arable fields which are considered unsuitable for reptiles. There is potential for other reptile species to be on Site as well as grass snake, however, given the limited extent of suitable habitats present on Site it is expected that any reptile population present is likely to be small and limited to the hedgerows and field margins only.

White-letter hairstreak

9.4.83 No mature elm trees were recorded within the hedgerows within the Site or along the northern boundary of the Site which is adjacent to the Salt Way (Tree Survey Report by Wardell Armstrong 2013).

9.4.84 During a site visit on the 21st May 2013, saplings and hedgerow shrubs of Wych elm were found to occur occasionally in hedgerows H1, H16. While English elm *Ulmus procera* was found to occur occasionally in Hedgerows H14 and H15 and elm species were present in hedgerow H6 (refer to drawing number CA10769/9.1 for locations of hedgerows).

9.4.85 None of these hedgerow shrubs showed signs of having flowered earlier in the year.

9.4.86 A number of immature saplings of elm were recorded along the northern boundary edge of the Salt Way. A cluster of six mature elm trees, in the vicinity of where the historic record of white-letter hairstreak was previously recorded, were located in the northern boundary edge of the Salt Way close to an existing housing development. No signs of these elms having flowered earlier in the year were visible.

9.4.87 These mature trees, located off-site, provide the most suitable habitat for white-letter hairstreak within the area included within the survey.

Other wildlife

9.4.88 Unidentified deer and red fox (*Vulpes vulpes*) were recorded within the Site during the walk over survey in 2012.

The projected future baseline

9.4.89 Without the Proposed Development, the Site is expected to remain in intensive use for the production of arable crops. The ecological habitats and the species they currently support; as outlined in this ES chapter, are not be expected to significantly alter if arable farming continued.

Nature Conservation Evaluation

Non-Statutory Designations

9.4.90 Local Wildlife Sites are equivalent to Sites of Importance for Nature Conservation. Therefore, Bretch LWS and the potential Salt Way LWS are considered to be of county value for nature conservation.

Habitats

Arable Fields

9.4.91 The arable fields are considered to be of negligible value for nature conservation as they are species poor and under intensive agricultural use. However, they may support ground-nesting birds and could potentially be of some foraging value for badgers and other wildlife and therefore do hold some value for some species.

Hedgerows

9.4.92 Hedgerows have the potential to provide foraging, breeding and resting opportunities for a range of wildlife and can act as corridors for wildlife through ecologically poor areas. In particular, they are being used by at least three species of bat. The majority of the hedgerows meet the UKBAP priority habitat criteria and six appear to meet the criteria for 'important' hedgerows under the wildlife and landscape criteria of the Hedgerow Regulations 1997.

9.4.93 The criteria are complex, and include hedgerows which have 7 woody species; hedgerows with 6 woody species plus at least 3 of the features identified in sub-paragraph 4 of the criteria (e.g. one standard tree for every 50m hedgerow length); or at least five woody species and at least 4 of the features specified in sub-paragraph 4. The application of the criteria to the hedgerows on Site relates mainly to the flora species present and is not an exhaustive assessment. Appendix 9.3 details the results of the application of the criteria to determine the potential for 'important' hedgerows under the wildlife and landscape criteria. The hedgerows have not been considered under the archaeology and history criteria of the Hedgerow Regulations 1997. Six hedgerows (Target notes H1, H2, H4, H12, H15 and H16) are considered to be of local value for nature conservation.

9.4.94 The remaining hedgerows within the Site are not considered to be 'important' under the wildlife and landscape criteria of the Hedgerow Regulations 1997. However, they do provide wildlife corridors and foraging opportunities for a range of species including at least three bat species as well as suitable nesting habitat for a range of breeding birds. Therefore, these hedgerows are considered to be of local value to nature conservation.

Mature/Semi mature trees

9.4.95 There are a numerous mature/semi-mature trees on Site which are associated with hedgerows. These trees are considered to be of neighbourhood value due to their potential value for wildlife, particularly breeding birds.

9.4.96 The 2012 bat surveys confirmed the presence of bat roosts within four mature trees on Site, as shown on Drawing CA10769-9.4 to CA10769-9.6. The potential night/feeding roost located along the western edge and the minor common pipistrelle roost along the southern boundary are located in mature pedunculate oak trees whereas the minor common pipistrelle roost along the northern boundary adjacent to the Salt Way and the minor pipistrelle roost to the north of Wykham Farm Cottage

(Tree 179) are located in mature ash trees. Five common pipistrelles in total were seen emerging from the ash tree on the Salt Way. The other trees are roosts to at least one bat. These tree roosts are considered to be minor roosts, probably of individual or a small number of bats. These four mature trees within the Site are considered to be of local value for nature conservation. Due to the density of trees along the western Site boundary and the level of bat activity immediately after dusk, it is possible that further tree roosts could exist along this boundary.

Broad-leaved Woodland / Mixed Plantation

9.4.97 The small area of broad-leaved woodland just outside the north-western corner of the Site, the strip of mixed plantation along the southern boundary, the mixed plantation along the path leading to Wykham Farm Cottage as well as the small stand of Douglas Fir provide foraging, shelter and nesting opportunities for small mammals, amphibians, possibly reptiles, badgers, birds and bats. These areas are therefore considered to be of local value in the context of the predominantly intensive agricultural nature of the Site.

Ponds / Watercourse

9.4.98 No waterbodies are present within the Site.

9.4.99 The water quality of the ditches/watercourses within the Site that drain to the Sor Brook are considered likely to be relatively poor due to regular clearance and dredging in line with the agricultural drainage function they perform. Such maintenance activities will prevent the long term establishment of any ecology in addition to stirring up suspended sediment leading to the deterioration of water quality. In addition the frequent use of agricultural chemicals and runoff from adjacent farming land and farm yards would further contribute to the deterioration of water quality which can be exacerbated by seasonally low flows. The ditches/watercourses within the Site are therefore considered to be of negligible value for nature conservation.

Protected Species

Flora

Protected / Notable Species

9.4.100 During the initial survey undertaken by Halcrow and the Extended Phase 1 Habitat Survey and update surveys undertaken by Wardell Armstrong, no legally protected, rare or scarce flora species were recorded on the Site. Therefore, the habitats on the Site are considered to be of negligible value for protected flora species, although it is

possible that some locally notable species may occur in the hedgerows or woodland habitats.

Fauna

Amphibians

9.4.101 No waterbodies are located within Site. From a 1:10,000 OS map, six waterbodies were identified within 500m of the proposed built footprint of the development Site. A reservoir is also located within 500m of the south-eastern corner Site boundary.

9.4.102 The habitats on Site potentially provide terrestrial habitat for amphibians including GCN, however the most valuable habitats for amphibians would be the woodland and hedgerows within the Site. Therefore, the hedgerows and woodland habitats within the Site are assessed as being of neighbourhood value for amphibians including for GCN.

Badgers

9.4.103 All information relating to badgers has been provided within the confidential Appendix 9.4 and is not for general public release.

Bats

9.4.104 Two mature pedunculate oak trees and two mature ash trees located on Site were being used by common pipistrelles as roost sites. These tree roosts are considered to be minor roosts for individual or a small number of common pipistrelle bats. The roost on the western boundary of the Site could potentially be a night/feeding roost for pipistrelle bats. As roosting bats are present within these trees, these trees are considered to be of local value for common pipistrelle bats.

9.4.105 Additionally, the hedgerows provide suitable foraging habitat and navigation routes for bats. The bat surveys undertaken in 2012 recorded at least four species of bat (common pipistrelle, soprano pipistrelle, noctule and a *Myotis* species) foraging and commuting along the hedgerows and woodland edges throughout the Site with the most activity predominantly along the hedgerows and woodland edges along the Site boundaries. Overall, the Site is considered to be of local value for at least four species of bat for foraging/commuting.

Birds

9.4.106 The Site provides breeding, feeding and nesting opportunities for bird species. The hedgerows and areas of woodland within the Site are important for breeding birds and are therefore considered to be of local importance for breeding birds. The open fields, although of less value for birds, do provide nesting opportunities for ground nesting birds such as skylark and therefore could potentially be of local importance for these species.

Brown Hare

9.4.107 The fields of arable crop and the hedgerows may offer potential sheltering and foraging habitat for brown hares with open farmland providing suitable habitat for these species and are therefore considered to be of neighbourhood value for brown hare.

Dormouse

9.4.108 Due to a lack of extensive woodland and suitable hedgerows with a range of food plants for dormice within the Site and the absence of dormouse records in the local area, the Site is considered to be of negligible value for dormouse.

Hedgehog

9.4.109 The hedgerows and areas of woodland could potentially provide suitable resting and foraging habitat for hedgehogs and therefore the habitats within the Site are considered to be of neighbourhood value for hedgehogs.

Invertebrates

9.4.110 The hedgerows, mature trees and woodlands have the potential to support a range of invertebrates within the Site, including the white-letter hairstreak. Therefore, these habitats within the Site are considered to be of neighbourhood value for invertebrates; however the majority of the Site comprises arable land which is considered to be of less value for invertebrates.

Reptiles

9.4.111 The presence of a grass snake was confirmed due to an incidental sighting during the Extended Phase 1 Habitat survey in 2012. From the habitats present on Site, it is considered highly likely that reptiles are limited to the hedgerows and field margins only as a large proportion of the Site comprises arable fields which are considered unsuitable for reptiles. There is potential for other reptile species to be on Site as well as grass snake, however, given the limited extent of suitable habitats present on

Site it is expected that the reptile population would be small and limited to the hedgerows and field margins only.

9.4.112 Therefore, the majority of the Site is considered to have negligible value for common reptiles. The hedgerows and field margins provide limited habitat for common reptile species and are therefore considered to be of neighbourhood value for a small number of common reptiles.

Other fauna

9.4.113 As there are no watercourses on Site, the habitats within the Site are considered to have no potential for otter, water vole or white-clawed crayfish. It is considered that the habitats are of negligible value for these species. These species are not considered further in this report.

9.4.114 The woodland and farmland within the Site provide foraging and shelter opportunities for deer and foxes and as such the Site is of local value for these species.

Summary of Nature Conservation Value

9.4.115 Table 9.11 summarises the nature conservation evaluation of the Site. Overall the majority of the area is of negligible value for nature conservation in a local context because it is for the most part intensively used agricultural land. The hedgerows and woodland areas are significant in a local context both in providing shelter, foraging and nesting opportunities for a range of fauna species.

Table 9.11: Summary of Nature Conservation Evaluation

Habitat/Fauna	Comments	Nature Conservation Value
Nature Conservation Designations		
Local Wildlife Site	Bretch	county
Potential Local Wildlife Site	Salt Way	county
Habitats		
Arable fields	May support breeding birds and be of foraging value for other wildlife. Species poor and intensively farmed.	Negligible
Hedgerows	6 potentially 'important' hedgerows	local

Habitat/Fauna	Comments	Nature Conservation Value
	Other hedgerows – provide wildlife corridors, foraging and nesting opportunities for wildlife including bats and birds.	Local
Mature/Semi mature trees	Particularly important for breeding birds 4 mature trees with confirmed bat roosts	Neighbourhood local
Broad-leaved Woodland / Mixed Plantation	Suitable foraging, sheltering and nesting habitat for range of species	Local
Ponds / Watercourse	No waterbodies present on site Ditches/minor watercourses	Negligible
Flora		
Protected species	No protected species recorded	Negligible
Invasive Species	No invasive species recorded	Negligible
Fauna		
Amphibians	Hedgerows, broad-leaved woodland and mixed plantation could provide suitable habitat for amphibians	Neighbourhood
Badger	See ***confidential*** Appendix 9.4	
Bats	Mature trees with confirmed bat roosts At least four species of bat utilising hedgerows and woodland edges for commuting and foraging.	local Local
Birds	Hedgerows, mature trees and woodlands provide suitable breeding and foraging habitat. Arable land provides suitable habitat for some ground-nesting birds.	Local
Brown Hare	Potential sheltering and foraging habitat	Neighbourhood
Dormouse	Lack of extensive woodland and hedgerows with a range of food-plants for dormice.	Negligible

Habitat/Fauna	Comments	Nature Conservation Value
Hedgehog	Hedgerows and areas of woodland provides suitable habitat	Neighbourhood
Invertebrates	Potential for locally notable species in hedgerows including the white-letter hairstreak butterfly, mature trees and areas of woodland	Neighbourhood
Reptiles	Hedgerows and field margins provide limited habitat for common reptiles	Neighbourhood
Otter, water vole and white-clawed crayfish	No suitable habitats present	Negligible
Other fauna	Habitats have potential to support deer and foxes	Local

9.5 POTENTIAL EFFECTS

9.5.1 The following impacts have been identified as those which the Proposed Development could potentially have in the absence of mitigation measures.

9.5.2 The Proposed Development of the Site will comprise residential areas, a primary school, a local centre and areas of formal and informal areas of public open space including sports pitches, general green space, strategic landscaping, play areas and allotments. There will also be sustainable urban drainage areas and roads and infrastructure, including a new roundabout junction.

Construction Stage

Non-Statutory Designations
Bretch LWS

9.5.3 Due to distance between the proposed Site and Bretch LWS, there will be no direct or indirect adverse impacts during the construction on this wildlife site.

Potential Salt Way LWS

9.5.4 Any additional noise and light from the Proposed Development may have short term adverse impacts during construction, , but overall the development is considered unlikely to have significant long term adverse impacts on wildlife using the Salt Way. A Construction Environmental Management Plan for the Site will include measures to minimise disturbance and protect the overall integrity of the pLWS during construction.

Potential Impacts on the Site

9.5.5 During the construction phases, there will be disturbance to habitats and wildlife from construction operations, e.g. removal of topsoil and clearance of vegetation. After construction, the area will be urban in character with a higher level of human activity thus resulting in greater disturbance to wildlife than at present.

Broad-leaved Plantations, Hedgerows, trees and trees supporting bat roosts

9.5.6 There is a risk that construction works within the crown spread of retained hedgerows and trees could damage the roots of the hedgerows and trees if no protection measures are undertaken. This would result in a probable minor to moderate adverse impact on the retained hedgerows and trees at a local level.

Ditches/Watercourses

9.5.7 The water quality within the ditches/watercourses could potentially be adversely affected during the construction works as a result of the following:

- Exposure of bare ground, earth movement, mobilising of sediment into surface water receptors through runoff from the Site;
- Wheel washing run-off, or muddy run-off from highways and construction access tracks within the Site;
- Pollution due to vandalism of stores or plant;
- Poor/inappropriate storage of materials and chemicals/fuels and wastes such as on permeable surfaces, adjacent to watercourses or without sufficient bunding capacity;
- Accidental spillages of fuels and polluting materials such as concrete;
- Creation of preferential pathways via piling operations, drainage schemes and service corridors; and
- Pumping of silt-laden surface water or groundwater accumulated on the application Site or via de-watering directly into controlled waters.

9.5.8 The severity of adverse impacts on the ditches/minor watercourses could potentially be minor to major at a local level depending on the scale and longevity of the pollution event. Such an impact should however not affect the Sor Brook as there is a reservoir located between the watercourse and the Sor Brook to the south of Wykham Lane which will sufficiently slow flows to allow any suspended sediment to settle out before reaching the brook.

Amphibians

9.5.9 Amphibians could potentially be harmed / disturbed during the construction works if present at the time of the construction works. Impacts on amphibians are discussed in more detail under the operational phase section.

Bats

9.5.10 There could be potential for a low number of common pipistrelles using the tree roosts to be disturbed by increased human activity, noise and lighting during construction works in the vicinity of the roosts.

9.5.11 Bats foraging in adjacent and retained habitats could be temporarily disturbed if construction works are undertaken between dusk and dawn due to increased noise and light levels. This adverse impact is considered to be of minor significance to bats at a local level, as this impact is short-term and bats will be able to utilise other suitable foraging habitats and alternative flight lines which are available in the local area.

9.5.12 It is therefore considered probable that the construction works could have a short-term minor adverse impact on individual bats at a local level as they may be displaced into alternative foraging areas and roosts.

Birds

9.5.13 If any vegetation clearance is undertaken during bird breeding season (March to August inclusive), there is a risk that breeding birds will be disturbed.

9.5.14 The construction works could also disturb breeding birds which could potentially be nesting within the retained hedgerows. Sudden high levels of human disturbance and noise may cause birds to abandon nests. Therefore, a minor to moderate adverse impact on breeding birds at a local level is expected if vegetation clearance is undertaken during bird breeding season (March to August inclusive).

Reptiles

9.5.15 There is a risk that any clearance and construction activities undertaken in the hedgerow habitats could potentially harm or disturb a low number of common reptiles if present at the time of the works. This could potentially result in an adverse impact of minor significance on local reptile populations at the time of the Site clearance although it is unlikely to be significant at a county or national level.

Other Fauna

9.5.16 During construction works, there is the potential for hedgehogs, badgers and other small mammals to enter any excavations which are left open overnight. In this case, it is probable that the Proposed Development could result in a minor adverse impact on small mammals without suitable mitigation measures in place.

Post-Completion Stage

Non-Statutory Designations

Bretch Local Wildlife Site

9.5.17 There could be a potential indirect impact as a result of an increase in recreational pressure from new residents on the Bretch LWS as the Salt Way potential LWS (pLWS) connects the Proposed Development to this Site.

9.5.18 The Bretch LWS comprises a mosaic of habitats including rough grassland, scrub and trees with a stream. There are also pockets of lowland calcareous grassland and lowland meadow priority UK BAP habitats. The Site is not known to support any UK BAP priority species, red data book species, nationally scarce species or red/amber birds of conservation concern. It is an abandoned ironstone working which connects to the Giants Cave Local Geological Site and is used as a local picnic area.

9.5.19 The availability of green open space within the Proposed Development for picnics and recreation will be more attractive to new residents for everyday recreational use. In particular, there are opportunities to design the general green spaces within the Site as an areas of informal natural greenspace. This space is more likely to be used by residents which may alleviate impact on other areas of greenspace nearby (including the LWS). There are also opportunities to manage this area for nature conservation and develop these areas as wildlflower meadows (which is one of the BAP habitats present in the Bretch LWS).

9.5.20 New residents are also considered more likely to visit the larger Easington Park (located approximately 1km to the north of the Site which includes more facilities such as a children's playground) than visiting the small (2.3ha) LWS which is located approximately 1.9km west from the Site by foot (approximately a 23 minute walk). Any additional use of the Salt Way from the Proposed Development is considered likely to be in relation to travel from "A to B" and therefore not result in a substantial increase in a number of visitors diverting from the Salt Way into the LWS. The number of additional visitors to the LWS due to the Proposed Development is therefore considered to be relatively low.

9.5.21 The Bretch LWS is used as a local picnic area and it is considered likely that the current recreational pressures on the Site are minor (to potentially moderate adverse during the summer months) with the most likely impacts being noise disturbing

wildlife and minor trampling of the BAP grassland habitats which are only found in pockets on the Site.

9.5.22 Aerial photography shows well-worn paths located throughout the LWS site. The majority of visitors, including the new residents at Land at Wykham Park Farm, to the LWS are likely to remain on existing footpaths especially if they are regularly maintained. Similarly, residents of the new development at Wykham Park Farm who may cycle to the Bretch LWS via the Salt Way pLWS are also likely to remain on the constructed cycle paths and not cycle over vegetation on a regular basis.

9.5.23 It is therefore considered unlikely that any increase in visitors to the LWS due to the new development will significantly impact the UK BAP grassland habitats in the LWS.

Salt Way Potential LWS

9.5.24 The development has the following potential ecological impacts on the Salt Way during its operation:

- Damage due to the a potential increase in pedestrian access points;
- Increase in residential pressure from use by new residents;
- Light and noise impacts;
- Loss of open land, immediately adjacent and south of Salt Way;
- Isolation of the Salt Way green lane from the countryside;
- Beneficial impacts of the Proposed Development on the Salt Way pLWS.

Damage due to the proposed access points

9.5.25 There are a number of existing gaps along the southern edge of the Salt Way where unofficial pedestrian access is gained onto the Site. It is proposed that there will a number of pedestrian /cycleway access points from the Proposed Development Site onto the Salt Way which are shown in the Indicative Movement Strategy (Figure 20) within the Design and Access Statement. To reduce any potential for damage to the existing “green lane” these access points will be aligned through the existing gaps in the southern tree line of the Salt Way, where possible and appropriate.

9.5.26 There may be need to remove some smaller trees and scrub to create slightly wider gaps but the removal of mature trees will be avoided where possible. The canopies

of the trees either side of the gaps will however remain connected which will retain the continuity of the wildlife corridor for bats. New planting will reinforce the framework of existing vegetation along the Salt way where necessary. It is therefore considered unlikely that there will be a significant impact on the integrity of the Salt Way in its value as a "green lane".

9.5.27 The possible loss of a few trees and scrub (if necessary) will be compensated for by the tree and shrub planting within the strategic landscape buffer located within the south western area of the Site.

Increase in recreational pressure from use by new residents

9.5.28 The Salt Way is part of the National Cycle Network (Route 5) and this section is also designated footpath and bridleway. During the ecological surveys, a significant number of people have been observed walking, cycling and riding throughout the day along the Salt Way and as such it is considered probable that this proposed LWS is already subject to at least a moderate level of use in the day.

9.5.29 It is considered likely that much of the increased weekday usage of the Salt Way will be for the purpose of reaching Bloxham Road and travelling into Banbury town centre for work or leisure. Therefore the increase in weekday use may only adversely impact one section (approximately half) of the proposed LWS. An increase in pressure along the whole length of the proposed LWS as far as the Bretch LWS may be expected at weekends. The Salt Way is unlit and therefore its usage at night by people is likely to be much less.

9.5.30 The surfaced track on the Salt Way is well defined and therefore it is anticipated that pedestrians, horse riders and cyclists will keep to this track and therefore disturbance to the tree-line will not be significant.

9.5.31 It is considered likely that although there will be probably be an increase in the number of individuals using this route due to the Proposed Development during the day this will not result in significant impacts on the integrity of the Salt Way pLWS or disturbance to wildlife.

Light and noise impacts

9.5.32 The Salt Way is already subject to some light and noise pollution from the playing fields and residential areas to the north. There will also be periodic short bouts of

noise from groups and individuals travelling along the Salt Way. It is considered likely that the local wildlife has become habituated to this background level of sound and light disturbance as birds and bats were recorded roosting and foraging along the Salt Way, deer were observed here and there were signs of badger paths.

9.5.33 The Salt Way will remain unlit and so its usage by the new residents at night is likely to be low which will decrease disturbance on local wildlife. Furthermore, the dark wildlife movement corridors along the periphery of the Site will be retained, where possible and appropriate, to minimise impacts on bat species.

Loss of open land, immediately adjacent and south of Salt Way;

9.5.34 The additional open space planting proposed within the northern boundary of the development adjacent to the Salt Way is considered likely to reinforce the green infrastructure network and enhance its ecological merit. Native species included in the planting mix will provide foraging and roosting opportunities for wildlife. It is considered likely that this planting approach will increase the Salt Way's value as a wildlife corridor and provide buffering for the proposed LWS from the surrounding existing and Proposed Development.

9.5.35 The southern boundary of the Proposed Development will be improved through planting enhancements in the existing plantation strip and improvements to the existing ditch through the addition of a swale or similar to act as a SUD. This will provide both terrestrial and aquatic opportunities for wildlife.

Isolation of the Salt Way green lane from the countryside

9.5.36 The majority of hedgerows H2 and H15, which are aligned north-south along the full extent of the Site, will be retained as part of the new development. There will also be two additional green corridors which will cross the Site from north to south from the Salt Way and these green corridors will connect the Salt Way to the wider countryside south of the Proposed Development. Appropriate management/ maintenance of retained hedgerows will help maximise their value to birds and other wildlife. These improvements to these hedgerows will increase their value as wildlife corridors connecting the Salt Way to the wider countryside.

9.5.37 A network of public open space is also proposed within the Site, largely focussed along the existing landscape features and will be connected by the new greenways created. Tree and hedgerow species will be maintained and enhanced where possible to form focal points along key views within the Site. New strategic planting will reinforce the framework of existing vegetation. Species will be selected to optimise habitat creation and ecological diversity. These will provide additional opportunities for wildlife and provide additional connectively across the Site and to the wider countryside.

9.5.38 The impact of isolation is therefore considered to be negligible due to retained, enhanced and additional connectivity provided by the Proposed Development.

Beneficial Impacts of the Proposed Development on the Salt Way LWS

9.5.39 The comments made by Cherwell District Council's Ecologist in her consultation response (dated 16th May 2013) include a statement that the Salt Way green corridor is currently in poor condition due to lack of management with sections of the hedgerow overgrown and gappy and the grass margins are dominated by bramble and scrub.

9.5.40 Cherwell District Council's Ecologist suggests that a public space such as this is more likely to be respected and valued if it has an attractive appearance and suggests that an enhancement scheme for the improvement and long term management of the Salt Way. The Ecological Assessment specifies a variety of measures to enhance the biodiversity at the Site (refer to the Mitigation Section), including enhancement of the Salt Way habitat.

Potential Impacts of the Proposed Development

9.5.41 The following impacts have been identified as those which the Proposed Development could potentially have *in the absence of mitigation measures*.

9.5.42 The approximate areas of existing habitats and allocated land use after development is summarised in the table below.

Habitats

Table 9.12 – Approximate Habitats / Land Use Before and After Development

Habitat / Land Use	Pre-development in ha – except linear features (m)	After Development in ha – except linear features (m)
Arable	49.34	0.00
Mixed Plantation/Strategic Landscape	2.04	3.28
Semi-natural broad-leaved woodland	0.21	0.21
Hedgerows	4073 m	3489 m
Dry ditch	788 m	788 m
SuDs	-	1.89
General Green Space	-	9.25 (9.51 including retained broadleaved woodland)
Play Space	-	1.89
Outdoor Sports	-	2.72
Allotments	-	0.90
Education	-	2.22
Local Centre	-	0.60
Residential	-	25.95
Existing tracks/roads/ new Infrastructure	0.87	3.51
TOTAL	52.46	52.46

Arable Fields

9.5.43 All of the arable land, approximately 49.34 ha, will be lost to the development and replaced by residential, education, areas of public open space, outdoor sports areas, allotments and a local centre, with associated infrastructure, landscaping and drainage channels. The arable fields are species poor, but may support a low number of ground-nesting birds such as skylark and may be used by small mammals and brown hare although the habitats are not optimal. It is therefore considered probable that the loss of the arable fields will have an overall negligible adverse impact on nature conservation at a local level.

9.5.44 Impacts on ground-nesting birds are discussed later in this section.

Hedgerows

9.5.45 The development will result in the removal of approximately 584m of existing hedgerow habitat. This includes 328m from hedgerow H13 and 141m of hedgerow H16. The construction of roads and a roundabout will also introduce breaks (approximately 74m in total) into hedgerow H12. The remaining 3489m of hedgerow will be retained within the development.

9.5.46 Overall, the development will result in a loss of 584m of hedgerow out of a total of 4073m equating to 14% loss of hedgerows from the Site.

9.5.47 The hedgerows are considered to be of local value to nature conservation and six of the hedgerows affected could be considered to be 'important' under the Hedgerow Regulations 1997. It is therefore considered that the permanent loss of approximately 14% of hedgerows and the fragmentation of some of the hedgerow network across the centre of the Site will result in adverse impacts of minor significance at a local level and have implications for local wildlife such as bats and birds which are discussed later in this section.

Mature/Semi mature trees

9.5.48 Mature and semi-mature trees are associated with hedgerows on Site. The development will result in the loss of some of the mature trees associated with hedgerows H12 and H13. The loss of these trees represents an adverse impact of minor significance on nature conservation at a local level. However, there is potential for further bat roosts to be present in the mature trees located in H12 and therefore the severity of the adverse impact predicted from the loss of mature trees could be greater.

Broad-leaved woodland/mixed plantation

9.5.49 The semi-natural broad-leaved woodland will be retained and the mixed plantation is being retained within the southern part of the Site as part of the development. There will be a 0.06 ha loss of mixed plantation in the area referenced as Target Note 2 on the habitat plan to facilitate the access road.

9.5.50 The stand of Douglas Fir will be lost to the development. These trees are non-native and therefore their loss is not considered to be significant in terms of nature conservation, although they may have some value for a low number of breeding birds.

Ditches/minor watercourses

9.5.51 The existing ditches/minor watercourse that flows from within the centre of the Proposed Development Site and then east toward Wykham Farm Cottage will be retained as part of the development. The ditches/watercourses within the Site were dry at the time of the 2012 and 2014 surveys. The Water Environment Chapter (Chapter 12) indicates that they are likely to have variable flow and have no flow during dry periods. The Water Environment Chapter also indicates that the watercourse is a tributary of the Sor Brook, located 500m to the south of the Site. The ecological status of the brook is considered to be good.

9.5.52 There is potential for the water quality of the ditches/minor watercourses to be affected post-construction due to the following:

- Sediment within surface water runoff;
- Contaminants from vehicle movements within the Site (i.e. pollutants within the runoff from hard standing areas such as roads and parking areas);
- Accidental spillages; and
- Discharge of wastes, chemicals or foul water to surface water sewer drains or ground.

9.5.53 The severity of adverse impacts on the ditches/minor watercourses could potentially be minor to major at a local level depending on the scale and longevity of the pollution event. Such an impact should however not affect the Sor Brook as there is a reservoir located between the watercourse and the Sor Brook to the south of Wykham Lane which will sufficiently slow flows to allow any suspended sediment to settle out before reaching the brook.

9.5.54 The removal of the application Site from agricultural production will reduce the level of agricultural chemicals discharged into the ditches/minor watercourses. This reduction in nutrient and pesticide input is considered to have a minor beneficial impact on the water quality within the ditches/minor watercourses at a Site level, providing that no pollution events occur from surface runoff entering the ditches/watercourses post-construction which could have adverse impacts on water

quality. This beneficial impact is considered to be negligible for the Sor Brook due to the size of its contributing catchment and surrounding agricultural land use.

Protected Species

Protected / Notable Flora Species

9.5.55 No legally protected, rare or scarce flora species were recorded within the application Site during the Extended Phase 1 Habitat Survey in 2012 and update survey in 2014. It is therefore considered that the Proposed Development will have a negligible adverse impact on these flora species.

Fauna

Amphibians

9.5.56 The results indicate that 'medium' sized populations of GCNs are present in Pond P1 and Pond P5. The suitability of Pond P6 for GCN and the presence/ likely absence of GCN could not be confirmed for Pond P6 due to access restrictions. The reservoir P7, is not located within 500m of the proposed ground works for the built development or sports pitches.

9.5.57 The local planning authority has a responsibility to consider the "Three Tests" under the Conservation of Habitats and Species (Amendment) Regulations 2012 when determining a planning application where there is a potential for a European Protected Species (EPS) to be affected. The first two tests relate to the need for the development and the existence of alternatives. The third test (under Regulation 53 (9)(b) of the Conservation of Habitats and Species (Amendment) Regulations 2012) considers whether the Proposed Development will result in significant impacts on the favourable conservation status of a European Protected Species. In order to do this, if an EPS is present, it must be demonstrated that adequate compensation and/or mitigation can be put in place as part of the development so that the conservation status of the species is maintained.

9.5.58 In addition, in order to comply with the Town and Country Planning (Environmental Impact Assessment Regulations) (England and Wales) Regulations 1999, the ES must include information which identifies all likely significant effects of the development on the environment and describe the measures envisaged to prevent, reduce and where possible offset any significant adverse effects on the environment. In the absence of survey information on Pond 6 and the reservoir, it is possible to assess potential impacts on GCN based on the available evidence on the habitats

present both on and off-site, combined with information on GCN ecology. A suitable mitigation strategy can be proposed and implemented should GCN be present which will ensure that residual impacts on GCN after mitigation are negligible.

9.5.59 In order to assess the potential impacts on GCN in the Ponds P1, P5 and potentially P6 and the reservoir, available evidence on the ponds, the habitat immediately surrounding these ponds, intervening habitats between the ponds and the Site and the habitats located on Site has been considered.

Habitats close to the ponds

9.5.60 Research has shown that the majority of a GCN population remains very close to its breeding pond (with most adults captured within 50m of ponds during pitfall trapping operations and very few animals captured at distances greater than 100m)[10]. Pond P1 is located over 240m from the Site and therefore it is anticipated that a significant proportion of any GCN population present at this pond would be found in the habitats in the immediate vicinity of the pond, which includes trees, scrub and tussocky grassland, and not in the limited terrestrial habitats within the Site.

9.5.61 Pond P5 is located 500m from the Site's southern boundary and therefore it is anticipated that the significant proportion of the GCN population present in this pond would be found in the habitats in the immediate vicinity of the pond, woodland and grassland meadow located nearby, and not in limited terrestrial habitat within the Site 500m away.

9.5.62 From aerial photographs, it also appears that habitats which occur in the immediate surroundings of Pond P6, which include gardens and a field of grassland could potentially be of more value to GCN, as opposed to the arable land on Site. Although Pond 6 is considered highly likely to be dry, if it were holding water and used by newts, it is considered likely that a significant proportion of any GCN population using Pond P6 would be using the immediate habitats around the pond rather than the limited terrestrial habitats on Site. This applies also to the reservoir. Any population of newts present within the reservoir would be expected to favour the grazed grassland habitats within 100m north and south of the reservoir rather than arable fields within the site and the arable fields to the east and west of the reservoir.

10 English Nature (2004) *English Nature Research Report 576: An assessment of the efficiency of capture techniques and the value of different habitats for the great crested newt* Triturus cristatus. English Nature, Peterborough.

Intervening habitats

9.5.63 The A361 road is located between Pond P1 and the Site which would form a significant barrier to GCN dispersal from Pond P1 into the Site. GCN from P1 would also have to cross arable land in order to enter the Site.

9.5.64 Pond P5 is separated from the Site by Wykham Lane and an extensive area of arable land which GCN may not disperse across in order to enter the Site.

9.5.65 There are no significant barriers to dispersal between the Site and Pond P6.

9.5.66 The reservoir is separated from the Site by Wykham Lane and a large field of arable land which GGN may not disperse across in order to enter the Site.

Habitats on Site

9.5.67 The terrestrial habitats on the Site, notably the hedgerows, have the potential to be used by amphibians as resting places and for foraging and over wintering. To a lesser extent, arable habitat could also be used by amphibians, but this habitat is of less value to these species.

9.5.68 It has been calculated that for:

- Pond P1 – 7.1ha of the application Site is located within 250-500m of the pond; of which 1190m is hedgerow and 0.21ha is woodland;
- Pond P5 – 0.05ha of the Site is located within 250-500m of the pond; of which 200m is hedgerow;
- Pond P6 – 0.36ha of the Site is located within 100m of the pond (of which 39m is hedgerow habitat, 0.09 ha mixed plantation and 0.02ha track); 8.28ha is located within 100-250m of the pond (of which 406m is hedgerow, 0.64ha mixed plantation and 0.07ha track); and 13 ha are located within 250-500m of the pond (809m is hedgerow and 0.59ha mixed plantation habitats and 0.02 track). The total hedgerow within 500m is 1252m.
- Reservoir (P7) – 1.06 ha of arable land and 64m of hedgerow within the application boundary lies within 250 - 500m of the Site.

Potential impacts

9.5.69 Given the above factors, it is considered likely that at most only a very small number of GCN from the populations based at the off-site ponds could potentially be present

in the Site and also that these individuals would mainly be restricted to the hedgerows and woodland habitats within the Site.

9.5.70 The Proposed Development on Site is considered to have two main potential impacts on GCN. These are loss of potential terrestrial habitat and harm/disturbance to individual GCN during Site clearance works.

9.5.71 The Proposed Development would result in the permanent loss of arable land from the Site and is the main habitat present on Site within 500m of Ponds P1, P5 and P6 and the reservoir. If any GCN populations should be present at P6 or the reservoir, it is considered extremely unlikely that any GCN using these waterbodies, in addition to GCN using Ponds P1 and P5, would forage within the arable fields in significant numbers. Therefore it is considered that there will be no significant adverse impact on GCNs as a result of the loss of poor quality terrestrial habitat (arable fields).

9.5.72 The woodland habitat (semi-natural broad-leaved woodland) and the majority of the hedgerows are being retained as part of the development. It is considered probable that the small loss of hedgerow habitat (14**%** of the total hedgerows on Site) to the development will have negligible impacts on GCN which are present in the off-site ponds as the majority of the suitable habitat within the Site is being retained, more suitable terrestrial habitats are currently present in the vicinity of the ponds and hedgerow habitats also occur in the surrounding areas.

9.5.73 There are opportunities to enhance the Site for biodiversity and the development proposals include for the provision of balancing ponds and other wetland features, areas of open space and landscaping. These elements of the development have the potential to provide beneficial impacts to amphibians, by providing new aquatic and more suitable terrestrial habitats on Site.

9.5.74 Individual GCN could potentially be harmed /disturbed if present when site clearance works are being undertaken. It is considered extremely unlikely that any GCN from Pond P1 and the Reservoir will be present within the parts of the Site that fall within 500m of these waterbodies. In relation to Pond P5, the only part of the Site to fall within 500m of these ponds would be a short section of the southern boundary which is being retained. The risk of harm and disturbance to any GCN which may be present in Ponds P1 – P5 and the reservoir is therefore considered to be low. It is therefore considered probable that the impacts of harm and disturbance on individual GCN, from Ponds P1, P5 and any, if present in the reservoir, will be negligible and

thus the site clearance operations are considered unlikely to affect the favourable conservation status of GCN populations in the local area. As such the third test would be passed and therefore the implementation of mitigation measures under a disturbance licence from Natural England under the Conservation of Habitats and Species (Amendment) Regulations 2012 would not be required.

9.5.75 As Pond P6 is located closer to the Site, if GCN are present in this pond, the likelihood of GCN being present in the Site is greater than for Ponds P1 and P5. However, given the factors stated above, it is unlikely that a significant proportion of any GCN population based at Pond P6 would be present in the hedgerows in the parts of the Site that fall within 500m of Pond P6. The hedgerows in these parts of the Site are being retained, however there will be significant ground disturbance within close proximity to these habitats in addition to a break being introduced into one hedgerow.

9.5.76 It is therefore considered that in addition to some limited habitat disturbance, a small number of individual GCNs could potentially be harmed / disturbed, if a population is present in Pond P6. This would represent a minor adverse impact on GCN populations in the local area. The potential loss of a few individual GCNs during site clearance operations is considered unlikely to affect the overall favourable conservation status of GCN populations in the local area.

9.5.77 As the survey has identified the presence of GCNs in Ponds P1 and P5, the habitat areas have been inputted into Natural England's Rapid Risk Assessment Tool to determine if a European Protected Species Development licence is required. If the Rapid Risk Assessment finds the risks to be 'Green - offence highly unlikely' or 'Amber – offence is likely', it may be possible to undertake works within the Site using Reasonable Avoidance Measures which would negate the need for a licence.

9.5.78 The Rapid Risk Assessment Tool suggests that for Ponds P1 and P6 (if there are any GNC's present) an offence is 'amber - likely' and for Pond 5 and the reservoir (P7) an offence is 'green - highly unlikely,' provided that no GCNs are harmed as a result of the works.

Badgers

9.5.79 Badgers and their setts are protected from harm and disturbance under the Protection of Badgers Act 1992. All information relating to badgers has been provided within the confidential Appendix 9.4 and is not for general public release.

Bats

9.5.80 All bat species and their roosts are fully protected under national and European legislation. Four minor common pipistrelle roosts have been identified within the Site. The level of bat activity recorded at the hedgerow H12 suggests that there could potentially be other minor roosts present in hedgerow H12. The main impacts on bats are considered to be:

- Roost Loss;
- Disturbance;
- Fragmentation and isolation; and
- Post-development interference impacts.

Roost Loss

9.5.81 The roosts are located in sections of hedgerows which are to be retained as part of the development and therefore will not be lost or damaged.

Fragmentation and isolation

9.5.82 Two of the roosts are located in the boundary hedgerows which are being retained. Common pipistrelles from these roosts should therefore be able to access the surrounding countryside and will not become isolated.

9.5.83 The night/feeding roost located in hedgerow H12 may become isolated due to two breaks being introduced to the north and south of the roost for two roads leading to a proposed roundabout. The impact to this roost may be lessened by the presence of two areas of woodland which have mature tree canopies that bridge over the road and which pipistrelles could use for navigation. One of these areas of woodland is located opposite the roost adjacent to Crouch Cottages and the other is the small parcel of woodland located in the north-west of the Site.

9.5.84 Although no bats were seen emerging or re-entering other mature trees in hedgerow H12, high bat activity recorded by the mature trees with bat roost potential suggests that further minor tree roosts could potentially be present in hedgerow H12 and therefore adverse impacts on bats could potentially arise due to the loss of any trees with bat roost potential. Most of these trees will be retained.

9.5.85 The results of the 2011 and 2012 bat surveys showed that at least four bat species were utilising the Site for foraging and navigation. Foraging bats could be affected by the removal of sections of hedgerow H13 and H16 and the introduction of breaks in hedgerows H2, H12 and H15. Surveys recorded bats foraging along all these hedgerows. The removal of these hedgerows could potentially decrease the foraging area available to bats on the Site and fragment several flight-lines through the centre of the Site.

9.5.86 Bats are likely to continue to forage along the majority of the retained hedgerows which will maintain a degree of connectivity of flight lines around the Site. It is considered unlikely that the loss of habitats on Site will disrupt connectivity between bat roosts located off-site and the foraging areas which will remain on the boundaries of the Site. Additionally common and soprano pipistrelles, which were the dominant species recorded on Site, are known to cross open areas and not to be as sensitive to gaps as, for example, Daubenton's bats which may not cross introduced gaps of approximately 7m. Noctules, which were also recorded at the Site, are also known to cross and forage over open areas. The loss of the majority of hedgerow H13 and part of H16 and small sections of H2, H12, H15 is therefore considered probable to be an adverse impact of minor significance on individual bats of at least four different species located in the area. This impact is unlikely to be significant at a district, county or national level and not as adverse for common and soprano pipistelles and noctule bats.

Post development interference impacts

9.5.87 Once the development has been completed, bats could be adversely affected as a result of increased lighting and noise within the Site, particularly security lighting. This permanent increase in noise and light levels at the Site has the potential to disrupt foraging and commuting bats, in particular along the retained hedgerows, although common and soprano pipistrelle and noctule bats are known to forage around lighting and street lamps. *Myotis* species may be more sensitive to increased lightning. It is considered that this disruption could result in long-term minor adverse impacts on individual bats at a local level as some of these individuals and species may forage elsewhere, although impacts on common and soprano pipstrelles and noctule bats are likely to be less significant.

9.5.88 The cessation of agricultural use in the Site could have beneficial impacts on foraging bats by increasing insect diversity in the area, in particular along the retained hedgerows and ditches.

9.5.89 There may be an increase in cats in the area as the residential areas become occupied which could potentially result in an increased number of bats being predated. It is considered that this could result in long-term minor adverse impacts on bat populations at a local level.

Birds

9.5.90 The loss of sections of two hedgerows and small sections in three other hedgerows due to the development will result in a reduction of nesting opportunities for tree nesting birds within the Site. Additionally, the loss of arable land will result in a decrease of foraging habitat for birds and the total removal of potential nesting habitat for ground-nesting birds such as skylark. The adverse impacts as a result of these losses are considered to be of minor significance to breeding birds in the local area. The retention of the hedgerows will continue to provide suitable foraging habitat for birds.

9.5.91 Ground-nesting birds, such as skylark, and other farmland bird species such as yellowhammer could potentially to be displaced by the development. The impact on these species from the development is therefore considered moderate at a Site level as these species would be lost from the Site, although this impact would be of minor significance at a local level and not significant at a district, county or national level, as populations of these birds could potentially use other farmland habitats in the local area.

9.5.92 The loss of arable fields and sections of hedgerow as well as the disturbance to foraging birds is considered unlikely to have significant adverse impacts on foraging birds at a local level, as large areas of similar foraging habitats are present in the local area.

9.5.93 Once the development has been completed, breeding birds could additionally be adversely affected as a result of increased noise level within the Site, although birds should be able to readily habituate to new levels of noise. The potential impacts on breeding birds post-construction are therefore considered to be negligible.

9.5.94 There may be an increase in cats in the area as the residential areas become occupied which could potentially result in an increased number of birds being predated. It is considered that this could result in long-term minor adverse impacts on bird populations at a local level.

Brown Hare

9.5.95 The Proposed Development will result in a loss of open arable fields including areas that could potentially provide suitable laying up and foraging habitat for brown hares. Any brown hares present on Site are therefore likely to be displaced from the Site into the surrounding farmland. This impact is considered to be minor on brown hares at a local level and not significant at a county or national level.

Dormouse

9.5.96 The habitats on Site are considered of negligible value for dormice and therefore the development is considered to have a negligible impact on dormice.

Hedgehog

9.5.97 The hedgerows located on Site have the potential to provide suitable resting and foraging habitat for hedgehogs. However it is considered that the loss of some of the hedgerow habitat due to the development is likely to result in a negligible adverse impact on hedgehogs, as areas of similar habitat are located in the vicinity in addition to other habitats which may be more suitable for hedgehogs e.g. woodland, grassland, parkland and gardens.

9.5.98 There may be an increased risk in road mortality on hedgehogs post-construction due to increased road traffic which could have long-term impacts of minor significance on hedgehog populations at a local level.

Invertebrates

White-letter hairstreak

9.5.99 Hedgerow H1 present along the southern boundary of the Salt Way “green lane” is to be retained and buffered from the Site by green space. The cluster of mature elms present further east of the Site along the northern edge of the Salt Way (close to the corner of the existing housing development to the north east of the Site) will not be affected by the Proposed Development.

9.5.100 There are a number of existing gaps along the southern edge of the Salt Way where unofficial pedestrian access is gained onto the Site. There may be the need to remove some smaller trees and scrub to create slightly wider gaps but the removal of

mature trees will be avoided where possible. However the tree survey did not record mature elm trees within Hedgerow H1 along the Salt Way therefore the potential to lose potential habitat of the white-letter hairstreak as a result of the development is negligible.

9.5.101 Elm shrubs are also present within hedgerows H6, H14, H15 and H16. H15 and H16 are considered to have the potential to be deemed 'important' under wildlife and landscape criteria of the Hedgerow Regulations 1997 and therefore the Proposed Development has sought to retain as much of these hedgerows as possible. H14 is a boundary hedgerow and will also be retained as part of the development.

9.5.102 Overall the impact from the loss of potential habitat for white-letter hairstreak that is present within the Site as a result of the development is negligible. It is considered that there will be beneficial impacts as a result of the development for white-letter hairstreak and other butterflies and invertebrates through appropriate landscape planting and management of habitats within the completed development.

9.5.103 If a pollution event occurs in the ditches as a result of the construction works or post-construction then there is the potential to harm freshwater invertebrates. Any pollution event has the potential to have a minor to major adverse impact on freshwater invertebrates depending upon the nature and extent of the pollution event.

9.5.104 The cessation of arable farming may benefit butterflies and other invertebrates overall and increase invertebrate diversity at the Site. The enhancements will also increase butterfly and invertebrate diversity at the Site, e.g. increase in aquatic invertebrates as a result of pond creation and increase in butterflies and other invertebrates due to wildflower meadow planting, creation of new landscape areas and enhancement and management of retained woodland and hedgerow habitat.

Reptiles

9.5.105 The loss of sections of hedgerow H13 and H16 and the introduction of breaks in hedgerows H2 and H15 could reduce the amount suitable habitat available for a low number of common reptiles within the Site which is already considered to be limited. The loss of hedgerows could also decrease the connectivity of suitable habitats within the Site which reptiles may potentially disperse along. This impact is assessed as being probably significant at a local level, although it will not be significant at a county or national level.

Other fauna

9.5.106 There may be an increase in road mortality post-construction due to an increase in roads and traffic in the area therefore it is considered probable that the Proposed Development could result in minor adverse impacts on these species at a local level.

Summary of Potential Impacts

9.5.107 Table 9.13 provides a summary of potential impacts of the development on the application area, prior to mitigation

Table 9.13 – Summary of Potential Impacts

Area	Major Impact Type	Value of Receptor	Predicted Impact	Mitigation
Statutory and non-statutory sites				
Bretch Local Wildlife Site	No impacts	County	None	Mitigation not required
Salt Way pLWS	Widening of existing gaps Loss of smaller shrubs and trees/ Isolation from Countryside	County	Minor	Mitigation proposed
	Increase in recreational pressure	County	Minor	Mitigation proposed
	Indirect effects during construction	County	Minor - short term	Mitigation proposed
Planning Application Area				
Habitats				
Arable land	Direct loss	Negligible	Negligible but minor impacts on some fauna species.	Not mitigatable
Hedgerows	Loss/damage but majority retained	Local	Minor	Mitigation proposed
Mature/Semi mature trees	Damage / loss of trees	local	Minor	Mitigation proposed
Woodland/ Mixed Plantation	Damage	Local	Minor	Mitigation proposed
Ditches	Indirect effects on water quality/ Temporary disturbance	Negligible	Minor-Major if pollution event Beneficial – improved water quality	Mitigation proposed

Area	Major Impact Type	Value of Receptor	Predicted Impact	Mitigation
Fauna				
Amphibians	Loss of limited habitat Harm/disturbance	N/hood	Minor	Mitigation proposed
Badgers	Included in confidential appendix 9.4			
Bats	Loss of roost Loss of foraging habitat and connectivity Disturbance	local	Minor	Mitigation proposed
Birds	Direct loss of breeding sites Harm/disturbance Direct loss of feeding habitat	Local	Minor	Mitigation proposed
Brown hare	Direct loss of laying up and foraging habitats Harm/disturbance	N/hood	Minor	Not mitigatable
Dormouse	No impacts	Negligible	Negligible	Mitigation not required
Hedgehog	Direct loss of suitable habitat Harm/disturbance	N/hood	Minor	Mitigation proposed
Invertebrates including white –letter hairstreak	Loss of limited habitat / harm as result of pollution event Improved water quality	N/hood	Minor - Major Beneficial	Mitigation proposed
Reptiles	Loss of limited habitat Harm/disturbance	N/hood	Minor	Mitigation proposed
Other fauna	Loss of habitat Harm/disturbance	N/hood	Minor	Mitigation proposed

9.6 MITIGATION MEASURES

9.6.1 Mitigation measures can be based on:

- Avoidance of impacts through re-location, re-design or changes in construction programme;
- Reduction of impacts - involving lessening the severity of an impact which cannot be avoided;
- Compensation for impacts through habitat creation or enhancement.

9.6.2 Throughout the process of development of the masterplan for the Site, consideration has been given to avoidance of significant ecological impacts where possible, reducing the severity of other potential impacts and consideration of opportunities for compensation through habitat creation or enhancement of retained habitats. This section therefore outlines the mitigation measures proposed for the Site. The mitigation measures are considered appropriately to address the main potential impacts identified above and are practicable and reasonable and will not affect the integrity of the Proposed Development.

9.6.3 One of the key principles in guiding the formulation of mitigation measures has been to retain continuity and functioning of the retained linear habitats, i.e. the hedgerows and trees. The masterplan provides for preservation of the majority of hedgerows which will be retained. This network of hedgerows linked to areas of open space combined with the creation of new green corridors will retain opportunities for wildlife to move around and beyond the application Site.

Construction stage

Statutory and Non-statutory Sites

9.6.4 A Construction Environmental Management Plan will outline mitigation measures required to protect retained vegetation along the Salt Way during the construction period of the development.

Trees, Hedgerows, Woodland and Mixed Plantation

9.6.5 In order to prevent damage to existing and retained hedgerows and trees, excavations near hedgerows and trees will be undertaken in accordance with BS5837:2012 – Trees in relation to design, demolition and construction.

Watercourses and Waterbodies

9.6.6 Due to the close proximity of the development to the drainage ditches which are being retained, the Environment Agency's Pollution Prevention Guidelines (PPGs) will be followed, in particular PPG 1 and 5, to prevent any pollution event affecting these and adjacent habitats.

9.6.7 Further measures to be undertaken to prevent pollutants and sediments entering the ditches and watercourses downstream are described in Section 12: Water Environment. These measures will be included in a Construction Environmental Management Plan for the Site.

Fauna

Amphibians

9.6.8 The Rapid Risk Assessment Tool suggests that for Ponds P1 and P6 an offence is 'amber - likely' and for Pond 5 and the Reservoir (P7) an offence is 'green - highly unlikely,' provided that no GCNs are harmed as a result of the works.

9.6.9 Of the land which falls within 500m of Pond P5, only the southern hedgerow is considered suitable for GCNs and as this is being retained the risk of harm to GCN is likely to be extremely low and therefore a licence application and mitigation measures in connection with Pond P5 is not required.

9.6.10 Of the land which falls within 500m of the reservoir only the hedgerows are considered suitable for GCNs and as these are being retained the risk of harm to GCN is likely to be extremely low and therefore a licence application and mitigation measures in connection with the Reservoir is not required. However, Reasonable Avoidance Measure (RAMs) are proposed to be undertaken in relation to land around pond P6 which will decrease the risk of harm to any GCN which may have dispersed from the reservoir.

9.6.11 For Ponds P1 and P6 the risk of an offence being committed is 'amber - likely'. Natural England recommends in these cases that reasonable avoidance measures (RAM) should be employed during site clearance works (including archaeological investigation works), construction and landscaping works to decrease the risk to GCN. If the risk to GCN can be reduced through implementing RAMs then a licence will not be required.

9.6.12 A draft method statement for employing RAMS during any further future archaeological investigations and construction/landscaping works is attached as Appendix 9.10.

9.6.13 A tool box talk and method statement will be given to contractors to notify them of the potential presence of a protected species, the methods employed to protect GCN and what to do if one is discovered.

9.6.14 If GCN are encountered during the archaeological, site clearance or construction works, works will cease and advice sought from Natural England.

Badgers

9.6.15 Mitigation measures for badgers are detailed in a confidential Appendix 9.4.

Bats

9.6.16 Prior to any felling or tree surgery as part of the development, appropriate trees will be re-assessed for their current bat roost potential and, if individual trees are assessed as having high bat roost potential, these trees will be subject to either a detailed inspection by a licensed bat-worker and/or further surveys to determine whether a roost is present. Should bats or evidence of bat occupation be found within the trees then it will be necessary to apply for a disturbance licence from Natural England to carry out mitigation and compensation measures (e.g. erection of new bat boxes and relocation of any bats found) for these European Protected Species under the Conservation of Habitats and Species (Amendment) Regulations 2012.

Birds

9.6.17 Wild birds use features such as trees, hedgerow, scrub and grasslands for nesting, therefore the timing of their removal will take into account breeding birds. Where it is possible, clearance of vegetation will be removed outside of the breeding season, i.e. between 1st September and 29th February. Pre-clearance checks for birds by an ecologist will be undertaken if it is necessary to clear vegetation outside of this time period.

Reptiles

9.6.18 It is considered unlikely that minor adverse impacts on individual common reptiles from the development, however as a precaution a method statement will be prepared

which will detail measures that can be undertaken during the construction works which will minimise and prevent harm to any common reptile i.e. grass snake that might be present at the time of the construction works. The method statement for the Site is provided in Appendix 9.11.

Other Fauna

9.6.19 Wooden planks will be placed in any excavations to be left open overnight to provide a means of escape for any brown hares, hedgehogs and other mammals which may enter the excavations.

Effectiveness of Proposed Mitigation Measures during Construction Phase

9.6.20 The mitigation measures listed above to be employed during the construction phase will be considered at the early planning stages for the construction phase. The measures will be included as appropriate within a Construction and Environmental Management Plan to be approved by the Local Planning Authority. A tool box talk regarding the ecological aspects of the Construction and Environmental Management Plan will be given to contractors to notify them of the potential presence of a protected species and the methods employed to protect the range of species considered above including retained vegetation.

Post-completion stage

Statutory and Non-statutory Sites

Bretch Local Wildlife Site

9.6.21 Due to the distances between the Proposed Development scheme and the Bretch Local Wildlife Site, no direct or indirect impacts are anticipated and therefore no specific mitigation measures are required.

Salt Way p Local Wildlife Site

9.6.22 Long-term management of the habitats for wildlife will be covered under an Ecology and Landscape Management Plan for the Site. Areas of scrub will be cleared from the Salt Way, where adjacent to the Site, and appropriate new planting and sowing of meadow mix will be undertaken along the grass margins of the Salt Way to enhance the poor condition of this pLWS. These measures will also be specified in an Ecological and Landscape Management Plan or reserved matters applications.

Habitats

Arable land

9.6.23 It is not possible to mitigate for the loss of arable land within the Site.

Hedgerows and trees

9.6.24 The primary ecological objectives of the retention of the majority of the hedgerows within the Site are to:

- Provide habitat for wildlife, particularly birds and bats;
- Provide opportunities for movement of wildlife around and beyond the Site.

9.6.25 In order to retain, as far as is possible, continuity of retained habitats within the Proposed Development, the substantial majority some 86%) of the hedgerows within the Site are proposed to be retained.

9.6.26 Within the built development, the retained hedgerows will be associated with roads or will be adjacent to areas of open space. . Appropriate management of retained hedgerows will be instigated so as to maximise their value to birds and other wildlife.

9.6.27 Where a retained hedgerow is in poor condition, and/or with poor species diversity, enhancement work will be undertaken, including:

- Gapping up the hedgerow with suitable local species;
- Management to establish at least 1 hedgerow tree for every 50m length of hedgerow including allowing elm species to mature into standard trees within the hedgerows;
- Introduction of a management regime to facilitate use of the hedgerow by wildlife; and
- Hedgerow flora planting with an appropriate seed mix (e.g. Emorsgate Seed Mix EH1).

9.6.28 The development also makes provision for the retention of the majority of the mature/semi-mature hedgerow trees.

9.6.29 Some 3.26 ha of new strategic landscape and a further some 9.46 ha of general green space to include planting, landscape buffers and street planting will be created within the development which will compensate for the loss of 584m of hedgerows to the development. The new hedgerows and areas of strategic landscape planting will comprise native species of local provenance such as a mixture of hawthorn,

blackthorn, elder, field maple, dog-rose, field rose and hazel and tree and shrub species with a known attraction to wildlife; rowan *Sorbus aucuparia*, holly *Ilex aquifolium*, dogwood *Cornus sanguinea*, guelder rose *Viburnum opulus*, silver birch, wild cherry *Prunus avium* and crab apple *Malus sylvestris*. Species of standard trees to be planted will include ash, pedunculate oak, sweet chestnut *Castanea sativa*, Scots pine *Pinus sylvestris* and Dutch-elm (disease resistant).

9.6.30 The Development Framework Plan JJG043-035/I indicates that new landscape buffers will be created adjacent to the Salt Way, along Bloxham Road, and along the extent of the southern boundary. The landscape buffer adjacent to the Salt Way will be approximately between 15-20m wide and include tree and shrub planting. The landscape buffer adjacent to Bloxham Road and north of the new roundabout will cover approximately 4 ha. Street tree planting will also be undertaken. A programme of planting will be instigated for these areas to provide mixed aged planting, which is of greater benefit to wildlife. The areas of structure landscape planting will provide additional tree and hedgerow habitats and connectivity within the Site which could benefit local wildlife such as bats and birds.

9.6.31 Appropriate management of the existing and new hedgerows and areas of structure landscape planting will be implemented to enhance their value for biodiversity. Details of this management will be included in an Ecology and Landscape Management Plan for the Site.

Woodland and scrub

9.6.32 Tree planting as part of the structure landscaping within the Site as described in the above section, once mature, will compensate for the loss of the stand of Douglas Fir. Species planted will include a mixture of native species such as hawthorn, blackthorn, elder, field maple, dog-rose, field rose, hazel, pedunculate oak, sweet chestnut and Scot's pine, Dutch-elm (disease resistant), rowan, dogwood, guelder rose, silver birch, wild cherry and crab apple.

9.6.33 The semi-natural broad-leaved woodland in the north-west of the Site will be enhanced for biodiversity. A glade will be created within the woodland with selective thinning of trees undertaken as appropriate. Woodland flora planting will also be undertaken using an appropriate seed-mix e.g. Emorsgate Seed Mix EW1.

Watercourses/waterbodies

9.6.34 The incorporation of SuDS techniques as part of the design process, including the use of retention basins, will ensure that impacts during operation on water quality from the development are reduced to an acceptable level, assuming these are maintained appropriately (see Section 12- Water Environment). Marginal and aquatic planting will be undertaken in the wetland areas to enhance their value for biodiversity, in particular in the smaller ponds. An appropriate seed mix, e.g. Emorsgate Seed Mix EM1 – Pond Edge Mixture), will be planted around the ponds and a range of aquatic species such as water forget-me-not *Myosotis scorpoides*, water mint *Mentha aquatica*, reed canary grass *Phalaris arundiacea*, brooklime *Veronica beccabunga* and water plantain *Alismo plantago-aquatica,* tufted forget-me-not *Myosotis laxis*, water-cress *Rarippa nasturtium-aquaticum*, branched bur-reed *Sparganium erectum*, floating sweet-grass *Glyceria fluitans*, fool's-water-cress *Apium nodiflorum*, blue water-speedwell *Veronica anagallis-aquatica* and broad leaved pondweed *Potamogeton natans* will be planted in the margins of the ponds.

9.6.35 The incorporation of the existing minor watercourse/ditch and the application of the SuDS treatment within the development means that there will be a net increase in wet and damp areas across the Site. The SuDS will create a range of aquatic habitats within the Site which could give rise to beneficial impacts on wildlife in the local area including bats, birds, invertebrates, amphibians and reptiles.

Grasslands

9.6.36 The development will include areas of formal open space, informal open space, greenways and allotments. Tree and scrub planting will be undertaken in these areas.

9.6.37 Areas of grassland will be created as part of public open space. The value of the proposed grasslands will be enhanced by allowing some areas of grassland to grow taller, particularly those around the proposed balancing ponds and hedgerows. Taller areas of grassland will provide cover for small mammals and be more attractive to terrestrial invertebrates.

9.6.38 Wildflower meadow planting will be undertaken in the more informal areas of public open space. These areas will be sown with an appropriate wildflower mix, such as Emorsgate Seed Mix EM1.

9.6.39 Bulb planting will also be undertaken in these areas in order to provide early nectar sources for invertebrates. Species included will be daffodil (*Narcissus* sp.), crocus sp, snowdrop (*Galunthus nivalis*), bluebell (*Hyacinthoides non-scripta*) and pignut (*Conopodium majus*).

9.6.40 Management specifications for open habitats will be developed in order to maximise their nature conservation value. Management will be detailed in an Ecology and Landscape Management Plan for the Site and include prescriptions as follows:

- Appropriate mowing regime, possibly once in early March and once in late September, with cuttings removed to retain stressed conditions and reduce the competitiveness of grasses;
- Lack of fertiliser input to retain a low nutrient status, which will discourage competitive species;
- Monitoring of the condition of the grassland on an annual basis and continued reassessment of management requirements.

Fauna

Bats

9.6.41 Bat-boxes will be erected in the semi-natural broad-leaved woodland in the north-west of the Site and on suitable mature trees in the retained hedgerows. This will enhance the retained habitats within the Site for bats by providing more roosting opportunities. It is proposed that four Schwegler 2F bat boxes, which are suitable for smaller bats like pipistrelles, and four Schwegler 2FN bat boxes, which attract some of the larger bats including noctule, will be erected in the north-west woodland and that four Schwegler 2F bat boxes and four Schwegler 2FN bat boxes will be erected on suitable trees in the retained hedgerows.

9.6.42 Bat foraging corridors within the Site, in particular along the Salt Way and along the mixed plantation woodland will be retained and managed primarily for nature conservation.

9.6.43 Where hedgerows are bisected with roads, trees will be allowed to grow to maturity on either side of the road to minimise the gap in canopy cover. New hedgerows and structure landscaping within the Site could potentially provide additional foraging and flight-lines for bats.

9.6.44 The new hedgerows will compensate for the small loss of existing hedgerows. Bats will also have foraging opportunities over new residential gardens and the new aquatic habitats (drainage basin and swale) within the Site. The landscape buffer planting adjacent to Bloxham Road and the new roundabout will provide flight lines for pipistrelle bats and connectivity to the retained mature trees, one of which contains a pipistrelle night/feeding roost.

9.6.45 Management of the semi-natural broad-leaved woodland and mixed plantation areas located within the Site may also bring about enhancements that will benefit the local bat populations. The management will be detailed in an Ecology and Landscape Plan for the Site.

9.6.46 Where possible, street and security lighting will be positioned so that light is directed away from bat flight-lines across the Site. The lighting specification will have regard to impact on bats, for instance by including lights with a low UV component, low wattage, lights with cowlings (or directional beams) At sensitive locations. The lighting scheme will also aim to maintain dark movement corridors along the periphery of the Site to minimise impacts on bat species which are more sensitive to lighting.

Brown hare

9.6.47 No specific mitigation measures are proposed for brown hare because it is likely that any brown hares using the Site will be displaced from the Site due to the increase in human disturbance and loss of large areas of open farmland.

Birds

9.6.48 Retention of the majority of the hedgerows and the mature/semi-mature trees will ensure that many species which are likely to be currently found on Site are able to remain. Structure landscape planting and creation of new hedgerows within the Site will also provide nesting habitat which will compensate for the loss of approximately 584m of hedgerows and the stand of Douglas Fir.

9.6.49 The Site will be enhanced for birds by erecting a range of nest boxes on existing trees within the retained woodland in the north-west and hedgerows. It is proposed that nine nest-boxes, including three nest-boxes with 26mm holes, three nest-boxes with 32mm holes and three open front nest-boxes will be erected in the woodland in

the north-west of the Site. A total of eighteen nest-boxes, including six nest-boxes with 26mm holes, six nest-boxes with 32mm holes and six open front nest-boxes will be erected on suitable trees and shrubs in the retained hedgerows.

Invertebrates

9.6.50 Retention and management of the hedgerows and creation of new habitats such as hedgerows, grasslands, tree/shrub and wetland features will maintain habitat opportunities for a range of terrestrial invertebrates. Surface water attenuation features such as balancing ponds will increase the value of the Site for aquatic invertebrates.

9.6.51 As an enhancement measure for the white-letter hairstreak, it is proposed that the retained hedgerows within the Site will be managed to allow some of the elm shrubs (in particular the Wych elm) to grow to maturity as standard hedgerow trees. Elm species resistant to Dutch elm disease will also be included in planting mixes for new hedgerows and landscape areas on the Site, in particular where these areas occur close to the Salt Way.

9.6.52 The drainage system at the Site will incorporate SuDS to ensure that impacts on water quality post-construction are minimised to an acceptable level.

Reptiles

9.6.53 As a habitat enhancement measure, two hibernacula for reptiles will be constructed. One will be located near where the grass snake was observed in an existing hedgerow along the northern boundary of the Site and one will be located near the surface water attenuation features.

9.6.54 The Ecology and Landscape Management Plan will include for placing some grass cuttings from the mowing of amenity grassland in areas of structure landscaping/retained hedgerows to provide potential egg-laying sites for grass snake which have been recorded in the north-east of the Site.

9.6.55 The surface water attenuation features may be used by amphibians in future which will increase the prey available within the Site for grass snake. The proposed allotments could also be of value for common reptiles.

Effectiveness of Proposed Mitigation Measures – Post-Completion Phase

9.6.56 The above measures will be included, where appropriate within in an Ecological and Landscape Management Plan (EMP) which will be approved by the by the Local Planning Authority.

9.6.57 The EMP will take into account the existing features of nature conservation interest within the Site, together with the development and associated landscape/ nature conservation proposals. It will describe the habitats that require management, the management objectives and specifications for each habitat and set out an appropriate future monitoring programme and provision for review

9.6.58 A monitoring report will be prepared to show the results of the implementation of the plan and the results of the management. The initial implementation of the management plan will be carried out by a landscape contractor appointed by the developer.

9.6.59 The subsequent management and monitoring of the plan will be carried out following agreement between the Developer and the Local Planning Authority.

9.7 RESIDUAL EFFECTS

9.7.1 Residual impacts are those that will remain after the mitigation measures are implemented.

9.7.2 Many of these measures are incorporated as an integral part of the design of the Proposed Development. This iterative process has resulted in the Proposed Development being designed and modified to take account of the surveys and assessments undertaken. This has enabled the extent and scale of the potential adverse effects to be continually appraised as part of the evolving Development Framework Plan and scheme design.

Construction Phase

9.7.3 In terms of ecology and wildlife, the key residual impacts during the construction phase are:

- Permanent loss of agricultural land;
- Reduction of populations of brown hare, if present;
- Potential loss of some breeding bird species associated with open land;
- Potential loss of hedgerow and trees as a result of damage during construction;
- Potential disturbance to fauna during construction phase.

9.7.4 There will be a permanent loss of agricultural land from the development. Whilst this impact is not mitigatable the residual impact in terms of biodiversity value is negligible.

9.7.5 Due to the extent of loss of arable habitat, it is likely that brown hares will be displaced from the Site, if present. The residual impact is considered to be minor adverse on brown hares at a local level and not significant at a county or national level.

9.7.6 Ground-nesting birds, such as skylark, and other farmland bird species such as yellowhammer could potentially to be displaced by the development. The residual impact on these species from the development is therefore considered moderate adverse at a Site level as these species would be lost from the Site, although this impact would be of minor adverse significance at a local level and not significant at a district, county or national level, as populations of these birds could potentially use other farmland habitats in the local area.

9.7.7 The loss of arable fields and sections of hedgerow as well as the disturbance to foraging birds is considered unlikely to have significant residual adverse impacts on foraging birds at a local level, as large areas of similar foraging habitats are present in the local area.

9.7.8 There is potential for proposed retained trees and hedgerows to be damaged during the construction phase. With the implementation of appropriate mitigation to protect retained vegetation by fencing root protection zones during the construction phase the residual impact on trees and vegetation will be negligible.

9.7.9 There is potential for disturbance and killing and injuring protected species (including bats, great crested newts, small mammals and reptiles) during the construction phase. With the implementation of appropriate measures outlined in the Construction Environmental Management Plan and method statements the residual impacts will be minor adverse to negligible for the duration of the construction phase.

Post-completion stage

9.7.10 In terms of ecology and wildlife, the key residual impacts post-completion stage are:

- Potential reduction of bat species through public disturbance and harm from cats in residential areas, but also potential gains because of habitat creation and enhancement of areas which can be used by foraging and roosting bats;
- Potential gains of small garden and wetland bird species;
- Potential increase in amphibians and reptile populations on Site due to provision of surface water attenuation features, public open space, allotments and landscape planting;
- Reduction in the populations of brown hare, if present;
- Risk of road mortality for hedgehogs and other wildlife which may enter the roads;
- Maturing of structural landscape planting, new hedgerows and marginal planting around surface water attenuation features; and
- Improvement of water quality in retained ditch/watercourse.

9.7.11 A range of birds will be able to exploit the landscape planting and wetland bird species which are not currently present on Site could potentially use any balancing ponds which are created within the development. Post-completion the residual impact on birds will be minor beneficial for species which prefer garden and wetland habitats.

9.7.12 It is likely that the risk of road mortality for hedgehogs and other wildlife which may enter the roads in the Site will remain which could result in a minor adverse residual impact at a local level. An increased risk of predation of birds and bats by cats will also remain which could result in minor adverse residual impacts on bat and bird populations.

9.7.13 In the long-term, the maturing of the new structural, hedgerow and marginal planting will provide habitat for wildlife, in particular breeding birds and foraging bats.

9.7.14 The cessation of agricultural production in the Site and the incorporation of SuDS into the development are likely to improve the water quality of the retained ditch/watercourse thus improving these habitats for wildlife resulting in minor beneficial residual impact. Insect diversity is also likely to increase at the Site which will in turn benefit other species such as bats and birds. The planting of Dutch resistant elm species will increase the potential habitat opportunities for the white-letter hairstreak.

9.7.15 The enhancements of the existing retained habitats and created habitats will be implemented and appropriate management of wildlife habitats will be maintained throughout the Site. It is therefore considered probable that there could be an overall minor beneficial residual impact on local species such as amphibians, birds, bats, invertebrates and common reptiles.

Summary of effects

5.7.3 The effects identified are summarised in Table B9.14 below:

Table B9.14: Summary of effects

Potential effect	Significance (pre-mitigation)	Mitigation measure	Significance of residual effect
Construction stage			
Permanent Loss of agricultural land	**Negligible**	N/A	**Negligible**
Reduction of populations of Brown Hare, if present	Minor adverse	N/A	**Minor Adverse**
Potential loss of some breeding bird species associated with open land	Minor Adverse	N/A	**Minor Adverse**
Potential loss of hedgerow and trees as a result of damage during construction	Minor Adverse	Fencing root protection zones during construction	**Negligible**
Potential disturbance to fauna	Minor adverse	Measures outlined in the Construction Environmental Management Plan and /or method statements	**Minor adverse to negligible**
Post-completion stage			
Potential reduction in bat population through public disturbance and harm from cats in residential area	**Minor adverse**	habitat creation and enhancement of areas which can be used by foraging and roosting bats	**Minor beneficial**
Increased risk of predation of birds by cats	**Minor adverse**	landscape planting and creation of balancing ponds	**Minor beneficial**
Potential increase in amphibian and reptile populations due to provision of water attenuation features, public open space, allotments and landscape planting	**Minor Beneficial**	Measures outlined in method statements and Landscape and Ecological Management Plan and Construction Environmental Management Plans	**Minor beneficial**
Reduction in Brown Hare population if present	**Minor adverse**	N/A	**Minor adverse**

Road mortality to hedgehogs and other wildlife which may enter the roads	**Minor adverse**	N/A	**Minor adverse**
Maturing of new structural, hedgerow and marginal planting will provide habitat for wildlife	**Minor beneficial**	Measures outlined in the Construction Environmental Management Plan and method statements	**Minor beneficial**
Improvement of water quality in retained ditch/watercourse due to cessation of agricultural production in the Site and incorporation of SuDS into the development improving habitats for wildlife	**Minor beneficial**	N/A	**Minor beneficial**

9.8 CUMULATIVE EFFECTS

Introduction

9.8.1 Land East of Bloxham Road (planning application reference 12/00080/OUT) is a scheme for which cumulative impacts along with the proposed Wykham Park Farm scheme should be considered.

9.8.2 The site known as Land East of Bloxham Road is located to the north-west and adjacent to the Wykham Park Farm Site has consent for development of 145 dwellings with associated infrastructure.

9.8.3 The cumulative impacts assessment assumes that similar habitats to those lost in the Wykham Park development are also being lost from Land East of Bloxham Road development namely arable land and small sections of hedgerow.

Potential cumulative impacts on the County Wildlife Sites

9.8.4 Due to the distances between the Proposed Development scheme and Bretch Local Wildlife Site, no direct or indirect cumulative effects on this site are anticipated for the reasons stated earlier in the impact section on Bretch LWS.

9.8.5 It is considered that although there will be probably be an increase in the number of individuals using the Salt Way LWS route due to the Proposed Development and the Land East of Bloxham Road development, during the day this will not result in significant impacts on the integrity of the Salt Way pLW or disturbance to wildlife as described earlier in the impacts section on the Salt Way pLWS.

Flora and habitats

Arable Fields

9.8.6 The Wykham Park Farm and Land east of Bloxham Road sites predominantly comprise intensively used agricultural land. The arable land will be lost in the event of the Proposed Development. Overall arable land is considered to be of negligible value to nature conservation, although it has some value to a few wildlife species.

9.8.7 In the context of the wider area, it is considered probable that the loss of the arable land to these Proposed Developments will have long-term adverse impacts on

ground-nesting birds and brown hares, but the cumulative impact is considered to remain minor on these species at a local level due to the scale of loss.

Hedgerows

9.8.8 As with the Wykham Park Farm Site, the majority of hedgerows within the Land East of Bloxham Road appear to be retained within the Proposed Development. The loss of some hedgerows which are considered to be of local value of nature conservation could represent minor adverse impacts at a local level, however the retention of the majority of the hedgerows will maintain connectivity around and throughout the development sites. New landscape planting as part of these schemes will also lessen the adverse impact.

9.8.9 The cumulative impact of retaining the majority of hedgerows within the developments will result in a long-term negligible impact, as a network of corridors will be retained across the local area for wildlife and new landscape planting will help compensate for loss of some hedgerows.

Mature trees / semi-mature trees

9.8.10 Several trees could potentially be lost as part of the proposed Land East of Bloxham Road development along the western boundary. The cumulative adverse impact is assessed as being of minor significance overall as the majority of hedgerows (which many of the mature and semi-mature trees are associated with) will be retained and landscape planting in the development sites will eventually compensate for the loss of these trees, once mature, which will reduce the severity of this impact in the long-term.

Woodland / Mixed Plantation

9.8.11 The development of Land East of Bloxham Road could also potentially damage the parcel of broad-leaved woodland in the north-west of the Wykham Park Farm Site therefore contributing to probable adverse impacts on this woodland. The severity of the cumulative impact on this woodland would still be considered to be minor.

Watercourses

9.8.12 A cumulative effect on watercourses could arise from these combined developments as the receiving sewerage network and its capacity could be reduced. Potentially this

can cause foul flooding, exacerbate existing flooding problems and impact on the water quality of local watercourses from combined sewer overflows and final effluent from sewage treatment works. In terms of the worst case scenario there is potential for a moderate adverse cumulative impact on the watercourses from the developments (see Chapter 12: Water Environment).

Fauna

Amphibians

9.8.13 The retention of the majority of the hedgerows within the Land East of Bloxham Road site, as well as the Wykham Park Farm Site, in addition to areas of public open space, surface water attenuation features and gardens, would provide terrestrial habitat for amphibians to disperse and forage along and it is considered probable that amphibian populations will be able to be maintained within these developments, although a small number of individuals, including GCN if present, may be harmed during construction works resulting in a minor adverse impact at a local level.

Badgers

9.8.14 The cumulative impacts of on badgers are detailed in the confidential Appendix 9.4.

Bats

9.8.15 Common pipistrelles can forage up to 3-4km from their roosts and therefore there is potential for cumulative impacts to arise on common pipistrelles using the roosts located at the Wykham Park Farm Site from hedgerow loss and fragmentation of the hedgerow network as part of the development of Land East of Bloxham Road.

9.8.16 The majority of hedgerows are being retained in the Proposed Developments however, providing flight-lines, connectivity and foraging areas for bats. The attenuation areas, public open space and landscape planting may also be used by foraging bats and will compensate for the sections of hedgerows lost to development.

9.8.17 There will be increased public pressure following the development with an increase in the levels of noise and light which could result in the value of the hedgerow network for foraging bats decreasing, although common and soprano pipistrelles and noctules which have been recorded at the Site are known to forage around lighting.

9.8.18 There is also the increased risk from predation by cats once the residential developments are complete. It is considered that there will be a minor cumulative adverse impact on bats in the local area.

Birds

9.8.19 In addition to retaining the majority of the hedgerows within the Wykham Park Farm Site, the majority of hedgerows will be retained in the Land East of Bloxham Road development with the loss of some hedgerows being compensated for by landscape planting. Attenuation areas in these developments may also attract a range of water-bird species which are not currently present and some bird species will be able to use residential gardens.

9.8.20 However, the cumulative loss of arable habitats will reduce the value of the area for some bird species, particularly ground nesting birds including skylark, which are likely to be displaced from these areas.

9.8.21 There is also the increased risk from predation by cats once the residential developments are complete. It is considered that there will be a minor cumulative adverse impact on birds in the local area.

Brown hares

9.8.22 Further loss of arable habitat in Land East of Bloxham Road site will reduce the value of the area for brown hares. This species is likely to be displaced by the developments probably to adjacent farmland to the south. It is therefore considered probable that cumulative impacts on brown hares will be minor adverse at a local level as this species is likely to be lost from the development areas although they will still be able to survive in the locality.

Hedgehog

9.8.23 The further loss of hedgerow habitats to the two developments will decrease the existing foraging area for hedgehogs in the local area. However, areas of similar habitat and areas which provides more suitable habitat for hedgehog are located in the surrounding area and this species will be able to utilise gardens, where accessible, and public open space once the developments are completed.

9.8.24 There could potentially be an increased risk of road mortality from increased traffic and roads in the area. It is therefore considered probable that the developments will have minor adverse cumulative impacts on the local hedgehog population mainly arising from the increased risk of road mortality.

Invertebrates

9.8.25 The majority of habitats, i.e. arable farmland, across the development sites are considered to have negligible value for invertebrates. However, the further loss of some hedgerows to the developments will decrease the amount of suitable habitat available for invertebrates. However, the proposed attenuation areas, landscape planting and public open space, as well as residential gardens, in the completed developments could provide suitable habitat for a diverse range of invertebrates and therefore it is considered probable that there will be negligible cumulative impacts on invertebrates overall.

9.8.26 If one or more pollution events were to occur in the watercourses during the construction works or post-construction across the developments, although unlikely, there could be adverse impacts on freshwater invertebrates due to a decrease in water quality. The severity of the cumulative impact would depend upon the nature, scale and timing of any pollution events. However, it is probable that there will be a beneficial cumulative impact on freshwater invertebrates as a result of the water quality in the local watercourses improving following the cessation of agricultural production as a result of the developments.

Reptiles

9.8.27 The habitats present within Land East of Bloxham Road and Wykham Park Farm sites are broadly similar and are considered to have limited potential for a small number of common reptiles. There is a risk of harm to a low number of individual reptiles which may be present during construction works and therefore it is considered unlikely to probable that the developments of both these sites will result in minor cumulative impacts on reptiles at a local level.

Other Fauna

9.8.28 No cumulative impacts are anticipated on dormouse, otter or water vole.

9.8.29 Cumulatively there will be impacts of minor significance on other fauna mainly arising from the risk of harm and disturbance during the construction works and increased risk of road mortality following the completion of the developments.

Summary of Potential Cumulative Impacts

9.8.30 Table 9.15 provides a summary of potential cumulative impacts of the development prior to mitigation measures as described above.

Table 9.15 – Summary of Potential Cumulative Impacts

Cumulative Impacts				
Statutory and non-statutory sites				
Bretch Local Wildlife Site	No impact	County	None	Mitigation not required
Salt Way pLWS	Slight loss to widen existing gaps/ indirect effects	County	Minor	Mitigatable
Cumulative Impacts				
Habitats				
Arable	Direct loss	Negligible	Negligible but minor – on some fauna species	Not mitigatable
Hedgerows	Loss/damage but majority retained	Local	Minor	Mitigatable
Mature / semi-mature trees	Direct loss / damage but majority retained	Local	Minor	Mitigatable
Woodland	Direct loss / damage to areas retained	Local	Minor	Mitigatable
Watercourses	Indirect effects	Local	Moderate	Mitigatable
Fauna				
Amphibians	Loss of foraging habitat for amphibian populations	N/hood	Minor	Partly Mitigatable

	Harm/ disturbance			
Badgers	Included in confidential Appendix 9.4			
Bats	Loss of foraging and flight-lines Harm post-construction	Local Local	Minor Minor -	Mitigatable Not mitigatable
Birds	Direct loss of breeding sites / Harm and disturbance Direct loss of feeding habitat Harm post-construction	Local	Minor - Minor Minor-	Partly mitigatable Mitigatable Not mitigatable
Brown hares	Direct loss of laying up and foraging habitats	N/hood	Minor	Not mitigatable
Dormouse	No cumulative impacts	Negligible	Negligible	Mitigation not required
Invertebrates including white-letter hairstreak Freshwater Invertebrates	Direct loss of habitat Harm if pollution event Improvement of water quality	N/hood	Negligible Minor – major Beneficial	Partly mitigatable
Reptiles	Direct loss of limited habitat Harm/ disturbance	N/hood	Minor	Mitigatable
Otter	No cumulative impacts	Negligible	Negligible	Mitigation not required
Water vole	No cumulative impacts	Negligible	Negligible	Mitigatable
Other fauna	Harm/ disturbance	Minor	Minor	Partly mitigatable

Non-Technical Summary

9.8.31 This section comprises an ecological impact assessment of the Proposed Development at Wykham Park Farm and the cumulative effects with regard to a proposed development at Land East of Bloxham Road, located adjacent to the Site, are also considered.

9.8.32 Baseline information has been gathered from consultations with statutory and non-statutory nature conservation bodies and from flora and fauna surveys of the Site.

9.8.33 There are no international or national statutory designations on or adjacent to the Site.

9.8.34 It is considered that although there will be probably be an increase in the number of individuals using this Salt Way pLWS route due to the Proposed Development during the day this will not result in significant impacts on the integrity of the Salt Way pLWS or increase disturbance to wildlife.

9.8.35 The development proposals outline a variety of enhancement measures which will include measures to improve the management and condition of the Salt Way pLWS habitat, where adjacent to the Site. Overall it is considered that the development will provide beneficial impacts and that the pLWS will still be able to operate as an effective wildlife corridor and provide habitats for local species that are present.

9.8.36 The Bretch Local Wildlife Site, is situated approximately 1.2 km to the north-west of the Site. It is considered unlikely that an increase in visitors to the LWS due to the new development will significantly impact the UK BAP grassland habitats in the LWS given the distance of the LWS from the Site and the availability of alternative green open space within the development and in Banbury to the north.

9.8.37 There are opportunities to design areas of public open space within the Site as informal natural greenspace. This space is more likely to be used by residents which may alleviate impact on other areas of greenspace nearby (including the LWS). There are also opportunities to manage this area for nature conservation and develop it as a wildflower meadow (which is one of the BAP habitats present in the Bretch LWS).

9.8.38 The majority of the Site comprises arable land. The most notable ecological features are the network of hedgerows and associated ditches, woodland and mature/semi-mature trees.

9.8.39 The majority of the hedgerows will be retained within the Proposed Development, maintaining a network of wildlife corridors and continuity with open space and other retained habitats. Hedgerows and woodland which are retained will be managed to

improve their nature conservation value and the areas of public open space will be enhanced through use of native tree and shrub planting and wild flower seed mixes. New areas of strategic landscape will also be created linking retained habitats to the countryside and adjacent pLWS. Aquatic habitat will result through the creation of surface water attenuation features and SuDS.

9.8.40 There will be direct loss of a stand of Douglas Fir however there will be new structure landscaping within the development which will compensate for this loss.

9.8.41 Retained habitats will be appropriately protected during construction works. The drainage schemes proposed will help prevent degradation in the water quality of the ditches. The cessation of agricultural production in the area is likely to improve the water quality in these watercourses.

9.8.42 Breeding birds and bats use the Site, in addition to other fauna such as badger and brown hare with limited habitat for amphibians, invertebrates and common reptiles. Measures are included to mitigate for the potential adverse impacts on these groups and to provide new habitat within the Site which will be beneficial to these species.

9.8.43 Residual impacts which will remain after mitigation will include an increased risk of predation on bats and birds by cats, increased risk of road mortality for wildlife entering roads, reduction in some bird species and brown hare populations within the Site and beneficial impacts on bats, birds, invertebrates, amphibians, common reptiles and other wildlife species as a result of habitat creation and enhancement measures and improvement of water quality in the watercourses.