9.0 Ecology and Biodiversity

9.1 Introduction

9.1.1 This chapter of the Environmental Statement (ES) will identify and describe the nature and significance of the effects of the potential effects on biodiversity and ecology as a result of the Proposed Development.

9.1.2 FPCR Environment and Design Ltd are instructed by Hallam Land Management to undertake an Ecological Impact Assessment (EcIA) as part of the ES submitted as part of the proposed development at North West Bicester (north east of the Marylebone- Birmingham railway line).

9.1.3 The assessment sets out the methods used to assess the impacts, the baseline conditions currently existing at the Application Site and surroundings, the potential direct and indirect impacts of the Development on biodiversity, the mitigation measures required to prevent, reduce or offset the impacts, and the cumulative and residual impacts. The assessment is set within the relevant planning and legislative context applicable to biodiversity and ecological resources.

9.1.4 Full details of the Proposals are provided in Chapter 2 of this ES. In summary, the NW Bicester Development extends to 177ha, comprising a mixed-use development with associated infrastructure. Green infrastructure will allow for a range of uses including formal and informal habitats, with a sustainable urban drainage system and allotments and a burial ground and a solar farm. This EcIA has been undertaken in the context of the above, based on the parameters as set out and the Illustrative Masterplan (drawing ref: HLM066-018) for the Application Site.

9.2 Regulatory and Policy Context

9.2.1 Chapter 3 provides the overall and wider planning context for the Site. The following section provides both the regulatory and policy context in respect of biodiversity and nature conservation.

Legislative Context

9.2.2 The following legislation and European Directives afford protection to wildlife and have been used to inform this assessment:

- Natural Environment and Rural Communities (NERC) Act 2006;
- Wildlife and Countryside Act (1981) (as amended);
- The EC Birds Directive (Directive 79/409/EEC), as translated into UK law by The Habitat and Species Regulations 2010 (as amended);

- The EC Habitats Directive (Directive 92/43/EEC) as translated into UK law by The Habitat and Species Regulations 2010 (as amended);
- The Protection of Badgers Act (1992); and
- The Hedgerow Regulations (1997).

9.2.3 The **Environment Act 2021** came into force on 9th November 2021, during the drafting of this chapter. Of particular relevance is the requirement for all developments subject to the Town and Country Planning Act to provide an at least 10% biodiversity net gain (BNG), as calculated using a Biodiversity Metric and a Biodiversity Gain Plan, with habitat used for net gain to be secured for a minimum of 30 years. Delivery of BNG may be on site, off-site or undertaken using statutory biodiversity credits. The requirement for BNG does not over-ride the need to apply the mitigation hierarchy (avoidance, mitigation and compensation) when considering biodiversity assets and their loss and does not change existing environmental and wildlife legal protection.

9.2.4 Whilst the Act mandates a 10% BNG delivery and for this to be a condition of planning permissions (Part 6 section 98 and Schedule 14 part 1), section 147 (3) states that this will only come into force once the secondary legislation is in place to support this requirement. Therefore there is a transition period (the length of which is not defined, but anticipated as being around 2 years) until the mandated 10% is required under law.

National Planning Policy Framework and Planning Practice Guidance

National Planning Policy Framework, 2021

9.2.5 The National Planning Policy Framework (NPPF) Paragraph 170 states that:

"Planning policies and decisions should contribute to and enhance the natural and local environment by:

a) protecting and enhancing valued landscapes, sites of biodiversity or geological value and soils (in a manner commensurate with their statutory status or identified quality in the development plan);

b) recognising the intrinsic character and beauty of the countryside, and the wider benefits from natural capital and ecosystem services – including the economic and other benefits of the best and most versatile agricultural land, and of trees and woodland."

9.2.6 Paragraph 170 of the NPPF also states that:

"d) minimising impacts on and providing net gains for biodiversity, including by establishing coherent ecological networks that are more resilient to current and future pressures."

9.2.7 With regard to planning applications and biodiversity, Paragraph 175 of the NPPF states that:

"When determining planning applications, local planning authorities should apply the following principles:

a) if significant harm to biodiversity resulting from a development cannot be avoided (through locating on an alternative site with less harmful impacts), adequately mitigated, or, as a last resort, compensated for, then planning permission should be refused;

b) development on land within or outside a Site of Special Scientific Interest, and which is likely to have an adverse effect on it (either individually or in combination with other developments), should not normally be permitted. The only exception is where the benefits of the development in the location proposed clearly outweigh both its likely impact on the features of the site that make it of special scientific interest, and any broader impacts on the national network of Sites of Special Scientific Interest;

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

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

9.2.8 In Paragraph 180, the NPPF advises that:

"Planning policies and decisions should also ensure that new development is appropriate for its location taking into account the likely effects (including cumulative effects) of pollution on health, living conditions and the natural environment, as well as the potential sensitivity of the site or the wider area to impacts that could arise from the development. In doing so they should: c) limit the impact of light pollution from artificial light on local amenity, intrinsically dark landscapes and nature conservation."

National Planning Practice Guidance

9.2.9 This guidance provides supporting information and context to the NPPF setting out what the government expects of local authorities. Guidance on the Natural Environment was updated in July 2019, with the green infrastructure and biodiversity, geodiversity and ecosystems sections of relevance to this assessment.

9.2.10 For green infrastructure it is recommended that a development should consider requirements at an early stage, integrated alongside the built development provision and taking into account the existing natural assets, as well as considering location and type. Funding of the GI should be identified and should allow for sustainable management and maintenance to ensure long term benefits, secured by planning conditions, obligations or other means, such as any CIL as appropriate.

9.2.11 For biodiversity, consideration should be given during the planning process the surveys required and undertaken for a development, sufficient evidence provided for the identified effects and their significance, that statutory and policy obligations are met and that there is adherence to the mitigation hierarchy. Measurable net gains should be provided which are genuine and demonstrable, delivered on or offsite, or in combination and these may be secured through planning mechanisms. Guidance highlights that it should be clear that gains are above those required in accordance with the mitigation hierarchy. Use of a metric, and the provision of a detailed management plan, including monitoring and remedial actions to ensure the gains are recommended. Full consideration of trees and woodland should be made to ensure suitability and appropriateness for the environment in which they are proposed,

including for wildlife, as well as supporting other environmental factors and interactions such as drainage, climate change etc, with appropriate compensation for effects.

Local Policy

9.2.12 The following local planning policies are of relevance to and have been considered as part of this assessment:

Cherwell Local Plan Part 1 2011-2031 (Adopted 2015)

Policy Bicester 1: NW Bicester EcoTown

9.2.13 This policy covers the whole NW Bicester Eco-Town of which this Site forms an integral part and incorporates many of the requirements of policy ESD 10. In accordance with this green infrastructure extending to 40% of the development site has been designed, much of which accessible to the new and existing community of Bicester, incorporating semi-natural spaces around and through the Site, with linkages to the surrounding habitats, opportunities for formal and informal recreation, including sport and play and SuDs features, all of which would be subject to a Landscape and Ecological Management Plan or similar. Design of these open spaces has responded to the highlighted need to enhance, restore and create wildlife corridors, retaining those features identified as being of particular value on Site, in themselves, their overall ecological functionality and/or for the fauna they currently, or could support, creating new habitats alongside to enhance these and lead to a net gain in biodiversity.

Policy ESD 10: Protection and enhancement of Biodiversity and the Natural Environment

9.2.14 In accordance with this, a comprehensive suite of surveys has been undertaken to understand the current value of the Site and its local context, informing the creation of a comprehensive green infrastructure, which retains and enhances identified features of value, contributing to and linking local green corridors. The development has sought to provide an overall net gain in biodiversity through design including retention, enhancement and creation of habitats, which will be managed to ensure their long-term viability and value. Consideration has been given to the general retention of individual trees at the Site, with the mitigation hierarchy applied to ensure there is no significant harm to features of value, including designated sites at all levels and habitats or species of principal importance as a result of proposals.

9.2.15 Also of relevance are policies, relevant nature conservation and biodiversity aspects of which have been considered:

- BSC 10: Open Space, outdoor Sport and Recreation Provision - Developments should provide sufficient open space for their proposals.
- ESD 1: Mitigating and Adapting to Climate Change – Developments should reduce their effects on the microclimate including through the provision of GI with open space and water, planting and green roofs.

- ESD 5: Renewable Energy – Developments with renewable energy aspects must ensure this does not adversely affect local biodiversity, including on designations, protected habitats and species and Conservation Target Areas.
- ESD 7: Sustainable Drainage Systems (SuDS) – where possible these should also provide wildlife benefits
- ESD 8: Water Resources – Proposals should not adversely affect the water quality of waterbodies including rivers
- ESD 17: Green Infrastructure - Including with reference to related nature conservation policies, this policy requires that green infrastructure is integral to new developments.

North West Bicester Supplementary Planning Document, 2016

9.2.16 This SPD provides the context, detail and vision for NW Bicester as a whole, as set out in Policy Bicester 1 above. It provides the masterplan framework for the area including incorporation of biodiversity assets, to which this Site has responded. The principle of green space providing a key feature is set, utilising existing habitat corridors including water course and hedgerows. Principle 9 sets the main aspirations and requirements of relevance to this assessment. Specific to this Site the highlighted opportunities for biodiversity to the primary focus are taken, notably within the country park and wildlife corridors, including smaller hedgerows corridors and the wider water course corridors, and the design principles for these areas reflect those detailed in this SPD. The Site has been subject to a feasibility Biodiversity Impact Assessment (BIA) under the DEFRA metric to inform design and show that a measurable gain can be achieved under the submitted framework plan and broad GI strategy In addition to this practical measures for biodiversity are indicated such as fauna boxes, and where on site impacts to fauna cannot be avoided, such as for farmland birds, proposals for compensation are provided in accordance with the SPD.

Oxfordshire and Cherwell Biodiversity Action Plans

9.2.17 Also of relevance are local Biodiversity Action Plans (BAP) detailing habitats and species of local importance. Oxfordshire has a spatial approach to biodiversity action planning, creating landscape scale Conservation Target Areas, which are important areas for wildlife. Species and habitats listed on S41 of the NERC Act and which are found in Oxfordshire are prioritised. Cherwell District Council have their own BAP.

Table 9.1: Relationship between UK and Local BAP habitats and species (habitats in bold indicate potentially qualifying habitats recorded at the Site)

UK BAP	**Oxfordshire BAP**	**CDC BAP**	***Priority*/Notable Species in Cherwell of relevance to Site**
Cereal field Margins	**Farmland**	Cereal Field Margins and **Farmland**	*House sparrow* *Skylark* *Grey partridge* *Brown hare*

			Lapwing
Species rich hedgerows	**Hedgerows**	**Hedgerow**s including Ancient or Species rich hedgerows	*Linnet* *Grey partridge* *Reed bunting* *Pipistrelle bat* *Song thrush* *Tree sparrow* Other bats
Lowland mixed deciduous woodland	**Lowland broadleaved woodland**	**Woodland**	*Bullfinch* *Song thrush*
Wet woodland	Wet woodland		
Parkland and Wood-pasture	Parkland Wood pasture and veteran trees	Parkland and veteran trees	-
Lowland meadows	Grazing marsh and neutral grassland	Neutral grassland and grazing marsh	*Skylark* *Grey partridge* Curlew Lapwing Snipe Meadow pipit Teal
Grazing marsh			
Lowland calcareous grassland		Lowland calcareous grassland	-
Reedbeds	Reedbeds	Wetlands (Fen, flushes, reed-beds and swamp)	-
Fen	Fens and flushes		
Mesotrophic standing water	**Ponds**, reservoirs, gravel pits, lakes and canals separately	**Ponds**, reservoirs, gravel pits, lakes and canals separately	*Great crested newt* Common toad Common frog Smooth newt
Chalk streams	**Rivers and ditches**	**Rivers, streams and ditches**	*Reed bunting* snipe
-	-	**Scrub**	**-**

9.3 Assessment Methodology

Overview of Approach

9.3.1 Previous assessments of previous schemes, including detailed habitat and faunal surveys for the previous application and land beyond, have provided a robust framework for identifying likely surveys required, together with review of desk top assessments and supplemented the primary baseline data collected for this assessment in accordance with standard best practice methodologies current guidance in place at the time of writing in 2020 as set out by the Chartered Institute of Ecology and Environmental Management (CIEEM) and recommended by NE, as well as other recognised bodies, as appropriate.

9.3.2 As part of the chapter an impact assessment of the Important Ecological Features (IEFs) has been undertaken in line with the Guidelines for Ecological Impact Assessment in the UK and Ireland (CIEEM, 2018) and covers the following:

a) Evaluation of identified important features; faunal species, habitats and vegetation (as appropriate) of an international, national and regional basis;

b) Description and evaluation of the magnitude and significance of the potential effects of the Proposed Development on statutory and non-statutory sites designated for nature conservation for both the Construction and Post-completion stages;

c) Description and evaluation of the magnitude and significance of the potential effects of the Proposed Development on species, habitats and vegetation, in accordance with current guidelines for both the Construction and Post-completion stages;

d) Detailed species-specific assessment;

e) Mitigation and enhancement measures to address the identified effects and identification of any residual effects following mitigation;

f) Cumulative assessment; and

g) A description and evaluation of residual effects of the Proposed Development.

Identification of Important Ecological Features (IEFs)

9.3.3 The Guidelines require identification of IEFs, formerly known as Ecological Receptors that could be significantly affected, either positively or negatively by a Proposed Development.

9.3.4 The regulations governing EIA only necessitate investigation of likely significant effects. According to the Guidelines, significance relates to the weighting attached when decisions are made. For the purpose of ecological assessment, a 'significant effect' is one that either supports, or undermines biological conservation objectives (e.g. national, or local policy objectives or legislative obligations) for the IEFs identified at the outset as requiring assessment.

9.3.5 IEFs may include habitats, designated sites and species of principal importance for conservation of biodiversity (under the Natural Environment and Rural Communities Act, 2006), as well as legally protected species.

Evaluation of Important Ecological Features (IEFs)

9.3.6 Ecological features will be evaluated in terms of their nature conservation value using the criteria set out in the Guidelines. Valuation of IEFs ultimately involves professional judgement based on available guidance, information and expert advice.

Scoping / Consultation and Response

9.3.7 The following statutory and non-statutory consultees have been consulted during the EIA process:

Table 9.2 Consultation and scoping responses

Consultee	Date	Comments	Actions undertaken
Cherwell District Council	07.10.2021	Cumulative impacts to be considered for features including direct and indirect 10% net gain sought with information on how to be achieved in ES. Demonstrate how development fits with SPD including with habitat linkages Reference to DLL scheme for great crested newts	Consideration during assessment BIA undertaken using DEFRA 3.0 (supporting document) Design and assessment Assessment
Natural England	23.09.2021	Consideration of all designated sites; protected species; habitats of principal importance Habitat survey equivalent to Phase 2; ornithological botanical, invertebrate surveys at appropriate season Avoid adverse impact on sensitive areas and provide opportunities for wildlife gain Contact with local records centres Consideration of air quality on ecology Consideration of Climate change Contribution to local initiatives and priorities Cumulative and in-combination effects	Assessment Extended Phase 1 habitat survey followed by comprehensive range of surveys suitable to habitats recorded Design of masterplan and GI Desk study with TVERC and MAGIC Assessment Assessment and Sustainability Chapter Assessment, mitigation and design of GI; BIA Assessment
Environment Agency	18.10.2021	Safeguards needed for quality water courses in terms of water quality and physical habitat	CEMP outlined Design of GI

Consultee	Date	Comments	Actions undertaken
		Incorporation of enhancements Use of DEFRA 3.0 including rivers and streams Alignment to NW Bicester SPD	BIA Undertaken Design and Assessment

Surveys Undertaken

9.3.8 A summary of the surveys undertaken and relevant appendix number is provided in Table 9.3 below.

Table 9.3 Technical report Appendices

Appendix	Title	Surveys	Dates
9.1	Phase 1 Habitat Survey Report	Desk Study Extended Phase 1 Habitat Survey with Hedgerow Surveys (HEGS and Regs) Surveys based on methods as set out by JNCC 2006 and recommended by Natural England	2020/2021
9.2	Bat Survey Report	Two seasonal transects and Automated Static Bat Detector Surveys on smaller red line. Two transect routes. Upgraded to monthly effort to determine bat activity and assemblage across Application red line. Three transect routes per occasion, with 2 static detectors per transect for 5 consecutive nights on each occasion. One survey comprised a dusk and dawn transect. Ground Assessment of trees and buildings for potential roost features Aerial assessment of 5 trees with bat roost potential likely to be removed Methods and effort as recommended in the Bat Survey Guidelines; Bat Conservation Trust; 2016, 3rd Ed.	July and September 2020 April – September 2021 November 2021
9.3	Great Crested Newt Survey Report	Habitat Suitability Index (HSI) Assessment (Oldham et al, 2001) and aquatic survey presence/absence as recommended by Natural England in the Great Crested Newt Mitigation Guidelines	2021
9.4	Reptile Survey Report	Presence/absence survey following survey protocol outlined in the Herpetofauna Workers Manual and	2020/2021

		the Froglife Advice Sheet 10 - Reptile Survey	
9.5	Breeding Bird Survey Report	Transect surveys broadly based on Territory Mapping as used for the he British Ornithology (BTO) Common Bird Census (CBC) to determine species assemblage	2021
9.6	Wintering Bird Survey	Transect surveys broadly based on Territory Mapping as used for the he British Ornithology (BTO) Common Bird Census (CBC) to determine species assemblage	2020/2021
[redacted]	[redacted]	[redacted],	[redacted]

Survey Methodology

9.3.9 All survey methodologies used within the assessment followed the published guidelines as accepted by the statutory and non-statutory agencies, including Natural England (NE) and the Chartered Institute for Ecology and Environmental Management (CIEEM). Methodologies used are presented within the relevant technical report for that survey at Appendices 9.1 – 9.7 of this Chapter. Relevant zones of influence used for the desk study are as follows:

- 10km – statutory designations at an international level
- 2km – statutory designations at a national or regional level
- 1km – statutory designations at a local level, non-statutory designations at a county or local level; protected and notable flora and fauna
- Site/adjacent – Listed habitats of principal importance (HPI) under the NERC Act

9.3.10 For the purposes of this chapter the term 'Application Site' or 'Site' refers to all land within the red line boundary as shown in Figure 9.1. The term 'Study Area' relates to the areas covered by the ecological surveys and desk-based survey which varies as appropriate for the ecological feature being considered, due to its sensitivity, size of home range etc., as well as the nature of predicted impacts.

Method for Assessing Baseline and Future Baseline Conditions

9.3.11 Assessment and evaluation has been made in accordance with the CIEEM guidance for EcIA, which recognises that evaluation is a complex process and that a range of factors need to be considered in attributing value to ecological features. Various characteristics can be used to identify features that are likely to be important in terms of biodiversity, including:

- Naturalness;
- Animal or plant species that are rare or uncommon, either internationally, nationally or more locally;
- Ecosystems and their component parts which provide the habitats required by the above species, populations and/or assemblages;

- Endemic species or locally distinct sub-populations of a species;
- Habitat diversity, connectivity and/or synergistic associations (e.g. Networks of hedgerows and areas of species-rich pasture that provide important feeding habitat for a rare species, such as greater horseshoe bat);
- Plant communities (and their associated animals) that are considered to be typical valued natural/semi-natural vegetation types – these will include examples of naturally species poor communities;
- Species on the edge of their range, particularly where their distribution is changing as a result of global trends and climate change;
- Species rich assemblages of plants and animals;
- Typical faunal assemblages that are characteristic of homogenous habitats.

9.3.12 The ecological features that may be affected by the Development have been evaluated within a geographical framework based on the ecological status of the features, but which also reflects a wide range of legislation and governmental guidance as indicated in Table 9.3 The guidance stresses there are many geographic contexts in which the importance of 'Important Ecological Features' (IEFs) can be assessed and the importance is in how these are defined). The significance of impacts is also then subsequently assessed based on this frame of reference.

Table 9.4: Geographic Frame of Reference

Level of Value	Examples
International and European	An internationally or European designated site or candidate site (SPA, pSPA, SAC, cSAC, pSAC, Ramsar site, Biogenetic Reserve) or an area which meets the published selection criteria for such designation, irrespective of whether or not it has yet been notified. A viable area of a habitat type listed in Annex I of the Habitats Directive or smaller areas of such habitat which are essential to maintain the viability of a larger whole. Any regularly occurring population of an internationally important species, which is threatened or rare in the UK (i.e. it is a UK Red Data Book species or listed as occurring in 15 or fewer 10km squares in the UK) or of uncertain conservation status or of global conservation concern. A regularly occurring, nationally significant population/number of any internationally important species.
National	A nationally designated site (SSSI, NNR, Marine Nature Reserve) or a discrete area, which meets the published selection criteria for national designation (e.g. SSSI selection guidelines) irrespective of whether or not it has yet been notified. A viable area of a priority habitat identified as a habitat of Principal Importance or smaller areas of such habitat which are essential to maintain the viability of a larger whole. Any regularly occurring population of a nationally important species which is threatened or rare in the region or county (local BAP).

	A regularly occurring, regionally or county significant population/number of any nationally important species.
Regional (East Midlands)	Viable areas of key habitat identified in the Regional BAP or smaller areas of such habitat which are essential to maintain the viability of a larger whole. Viable areas of key habitat identified as being of Regional value in the appropriate Natural Area profile. Any regularly occurring, locally significant population of a species listed as being nationally scarce which occurs in 16-100 10km squares in the UK, or in a Regional BAP or relevant Natural Area on account of its regional rarity or localisation. A regularly occurring, locally significant number of a regionally important species. Sites which exceed the County-level designations but fall short of SSSI selection guidelines, where these occur.
County (Nottinghamshire)	Semi-natural ancient woodland greater than 0.25 ha. County/Metropolitan sites and other sites which the designating authority has determined meet the published ecological selection criteria for designation, including Local Nature Reserves selected on County/metropolitan ecological criteria (County/Metropolitan sites will often have been identified in local plans). A viable area of habitat identified in County BAP. Any regularly occurring, locally significant population of a species which is listed in a County/Metropolitan "red data book" or BAP on account of its regional rarity or localisation. A regularly occurring, locally significant number of a County/Metropolitan important species.
Local (with further sub levels as appropriate)	Areas of habitat considered to appreciably enrich the habitat resource within the context of the Parish or neighbourhood (e.g. species-rich hedgerows). Local Nature Reserves selected on Parish ecological criteria.

9.3.13 Features with a value of Local or above were considered to represent IEFs. Those features not meeting the criteria for IEFs were classified as having below local (that is, not considered to appreciably enrich the habitat resource at the local level, although they may provide some habitat diversity within the immediate context of the Site itself), or Negligible ecological importance. These features are excluded from further assessment given that impacts on such features are considered insignificant regardless of the nature or magnitude of the potential impact.

Method for Assessing Impacts and Magnitude and Significance of Effects

9.3.14 The likelihood that a change/activity will occur as predicted has a degree of confidence assigned. The categories of confidence used are provided in Table 9.5.

Table 9.5: Level of Confidence in Predictions

Level of Confidence	Estimated Probability
Certain/Near Certain	Probability estimated at 95% chance or higher
Probable	Probability estimated below 95% but above 50%
Unlikely	Probability estimated below 50% but above 5%
Extremely Unlikely	Probability estimated at less than 5%

9.3.15 The impacts of the Development have been predicted, taking into account different stages and activities within the development process. Impacts have been considered both individually and cumulatively. When describing impacts on an ecosystem, structure or function, reference is made to the terms as described in Table 9.6.

Table 9.6: Terms used to Describe Impacts

Parameter	Definition of parameter
Positive or Negative	Whether the impact has a positive or negative effect
Extent	The area of which the impact occurs
Magnitude	The size or amount of an impact
Duration	The time for which the impact is predicted to last prior to recovery or replacement of the resource or feature
Reversibility	Whether the impact is permanent (i.e. irreversible) or temporary (i.e. reversible)
Timing and Frequency	How often the impact occurs (e.g. repeated noise from piling work) and when it occurs (e.g. vegetation clearance undertaken outside of the bird breeding season.

9.3.16 The Town and Country Planning (Environmental Impact Assessment) Regulations 2017 (as amended) require that attention be paid to all likely forms of effects. These may be:

- Direct or indirect;
- Short or long-term;
- Intermittent, periodic or permanent; and
- Cumulative.

9.3.17 Potential effects prior to mitigation include:

- Direct loss of habitats and associated flora and fauna within the Site boundary, interruption of wildlife corridors, decrease in value to wildlife through reduction in species and/or habitats;
- Indirect effects on retained vegetation within and bordering the Site, through increase disturbance and through local changes in soils, drainage and hydrology;
- Potential effects upon protected and scarce species through disturbance;
- Operational effects such as pollution incidents from chemical spills, pollution of streams and fragile habitats from runoff and incorrect storage of materials; and
- Long-term effects arising as a result of the favourable restoration of the Site to beneficial after-use.

Magnitude

9.3.18 Magnitude of effects has been determined based on the scales described in Table 9.7:

Table: 9.7: Methodology for Assessing Magnitude

Parameter	Definition of parameter
Major	Total loss or major/substantial alteration to key elements/features of the baseline (pre-Development) conditions such that the post Development character/composition/attributes will be fundamentally changed.
Moderate	Loss or alteration to one or more key elements/features of the baseline conditions such that post Development character/composition/attributes of the baseline will be materially changed.
Minor	A minor shift away from baseline conditions. Change arising from the loss/alteration will be discernible/detectable but not material. The underlying character/composition/attributes of the baseline condition will be similar to the pre-Development circumstances/situation.
Negligible	Very little change from baseline conditions. Change barely distinguishable, approximating to a 'no change' situation

Significance

9.3.19 The ecological significance of any impact has been assessed, based upon the likely effect on the structure, function or conservation status of the feature. The assessment of impact significance is undertaken to identify the need for mitigation and also to assess residual effects.

9.3.20 The significance of likely effects was determined by identifying those ecological features likely to be affected. The features were evaluated to identify the important ones, i.e. those which, if their level of importance reduced, national or local policies (or in some cases legislation) would be triggered. The nature of the individual and combined impacts (positive or negative) were characterised on each important feature, to determine the longevity, reversibility and consequences for the feature in terms of ecological structure and function and/or the conservation status of a habitat or species. As part of the process of determining whether there is likely to be an effect on the integrity of a site or ecosystem, the following questions are considered:

- Will any site/ecosystem processes be removed or changed?
- What will be the effect on the nature, extent, structure and function of component habitats?
- What will be the effect on the average population size and viability of the component species?

9.3.21 Once an impact is considered to be significant then the scale of impact is assessed on a geographical scale (i.e. international, national, regional, county etc.) as above. For example,

the impact may not be significant at a county scale but is significant at a more local scale. For the purposes of this Chapter, likely significant effects on IEFs are those identified as being of significance at a local scale or above.

Mitigation, Compensation or Enhancement

9.3.22 For the purposes of the EcIA, impacts on IEFs are assessed without mitigation in place. Mitigation or compensation is identified for significant impacts on features of nature conservation importance. In line with current CIEEM guidelines, the mitigation proposals for the Development should follow the mitigation hierarchy and aim to:

- Avoid negative ecological impacts – especially those that could be significant;
- Reduce (mitigate) negative impacts that cannot be avoided;
- Compensate for any remaining significant ecological impacts; and,
- Seek to provide biodiversity net benefits over and above meaures required to avoid, mitigate or compensate identified effects.

9.3.23 Priority is given to avoidance of impacts, where possible, through design and/ or regulation of the Development through aspects such as timing, storage of materials etc. Where this is not possible opportunities are sought to reduce the impacts as much as is feasible. If significant impacts cannot be avoided through mitigation, then compensation that is considered appropriate to offset the negative impacts of the Development should be outlined. Where it is known to exist, evidence is supplied for the effectiveness of proposed mitigation or compensation.

9.3.24 Development should be sustainable, and projects should seek to provide a net gain for biodiversity, as promoted through national and local policies. Enhancement should therefore be an objective of all projects, and refers to gains, such as from improved management or habitat creation, which are unrelated to an identified negative impact or, are over and above that required for mitigation or compensation of an identified effect, and will therefore deliver a net biodiversity gain or benefit.

Limitations and Assumptions

9.3.25 Details of any limitations encountered and assumptions made during these surveys are provided in the relevant Technical Appendix. No limitations encountered were considered to have significantly affected results or subsequent assessment.

9.4 Baseline Conditions

Designated Sites

9.4.1 Table 9.8 provides a summary of relevant nature conservation designations within the search areas. Figure 9.1 illustrates these. No international level statutory designations (SPA/SAC/RAMSAR) were returned for the 5km zone of influence. Four statutory designated

sites are located within the 2km zone of influence for the Site, one of which lies in close proximity to the eastern boundary, west of the A4095, being three Sites of Special Scientific Interest (SSSI) and one Local Nature Reserve (LNR). Three non-statutory designated sites, comprising one Local Wildlife Site (LWS), one Cherwell District Wildlife Sites (CDWS) and one proposed CDWS, lie within the 1km zone of influence. Sections of two Conservation Target Areas (CTA) also fall within this zone of influence. Two HPI were listed on Natural England's mapping website (www.magic.gov.uk).

Table 9.78 Summary of Designated Sites/HPI within Zone of Influence

Site Name	Status	Summary	Size	Proximity To Site	Evaluation /Frame of Reference
Ardley Cutting and Quarries	SSSI	Lying along a section of the London-Birmingham railway (which forms the site's southern boundary further to the east of the SSSI), it is primarily of geological interest, however as a result of the underlying strata supports one of the largest limestone grasslands in Oxfordshire, with a number of characteristic botanical species. Woodland areas support characteristic and uncommon species, with wetland habitats also extant. As a result supports a rich an notable invertebrate fauna with uncommon species within the county and a nationally rare moth. The pools support a large population of great crested newts	40.13ha	400m west	National
Ardley Trackways	SSSI	A geological designation for which no ecological interests are cited. This Site is not considered further.	63.9ha	1670m west	National
Stratton Audley Quarries	SSSI	A geological designation for which no ecological interests are cited. This Site is not considered further.	8.7ha	2km east	National
Bure Park	LNR	Habitats include grass meadow, young broad-leaved woodland, hedges, and scrub. A small river (the Bure) runs through the site, feeding a small pond which is home to great crested newts. A balancing pond at one end of the Reserve is fed by run-off from the area.	8.4ha	To the immediate east of the A4095	Local
Bicester Airfield	LWS	Airfield with peripheral areas of species rich and rough grassland and former runways, supporting diverse range of plants including early successional vegetation over open mosaic habitats on previously developed land and calcareous grassland.	161ha	1km east	County
Skimmingdish Lane	CDWS	Small area of unimproved lowland grassland grassland, wetland and	1.4ha	965m east	Local

Site Name	Status	Summary	Size	Proximity To Site	Evaluation /Frame of Reference
Balancing Pond		scrub. Drier grassland supports species rich sward, with wetter areas comprising tall herb, marsh and swamp habitat. Supports common lizard and a number of notable bird and bat species.			
Skimmingdish Lane Balancing Pond (east)	pCDWS	Species rich Unimproved grassland with remnants of lowland meadow) and scrub.	0.5ha	965m east	Local
Ardley and Heyford	CTA	Limestone plateau, including Upper Heyford Airfield, quarries, railway line and trackways. Supports 50% of Cherwell district calcareous grassland. Great crested newts, notable birds and butterflies all occur. Also has geological and heritage interest.	1186ha	400m west	County
Tusmore and Shelswell Park	CTA	Lowland mixed deciduous woodland, parkland, ancient woodlands, lakes and wet woodland.	844ha	1km north west	County
Broadleaved Deciduous woodland	HPI	Listed on National Forest Inventory and MAGIC. Low confidence in classification,	-	Small woodland block on Site & woodland adjacent to north	Local
Woodpasture and parkland	HPI	Listed on MAGIC. Medium confidence in classification	-	Fields adjoining to west	Local

9.4.2 Table 9.9 provides a summary of the protected and notable species within the 1km Zone of Influence. All protected and/or notable S41 species listed below are noted as part of the Oxfordshire Biodiversity Action Plan as being recorded in Oxfordshire.

Table 9.9 Protected and Notable Species

Species	Status	Number of records	Location of Closest Record
Bats			
Noctule *Nyctalus noctule*	LBAP, WCA Sch5, NERC S41	1	40m South East
Common pipistrelle *Pipistrellus pipistrellus*	LBAP, WCA Sch5	3	500m East
Brown long-eared bat *Plecotus auratus*	LBAP1, WCA Sch52, NERC S413	2	500m East
Soprano pipistrelle *Pipistrellus pygmaeus*	LBAP, WCA Sch5, NERC S41	1	890m South East

Species	Status	Number of records	Location of Closest Record
Herptiles			
Common lizard *Zootoca vivipara*	WCA Sch5, NERC S41	2	300m South
Smooth newt *Lissotriton vulgaris*	NERC S41	1	300m South
Great crested newt	WCA Sch5, NERC S41, ECCD	2	500m South
Grass snake *Natrix Helvetica*	WCA Sch5, NERC S41	1	755m West
Common frog *Rana temporaria*	NERC S41	2	300m South
Terrestrial Mammals			
Brown Hare *Lepus europaeus*	NERC S41	1	400m North West
Hedgehog *Erinaceus europaeus*	NERC S41	10	40m South
[redacted]	[redacted]	[redacted]	[redacted]
Birds			
Swift *Apus apus*	*Amber list* NERC S41	160	120m South East
Kestrel *Falco tinnunculus*	*Amber list*	5	160m East
Tawny Owl *Strix aluco*	*Amber list*	2	350m North West
Song thrush *Turdus philomenus*	*Red list* NERC S41	1	970m East
Starling *Sturnus vulgaris*	*Red list* NERC S41	1	1000m East
Bullfinch *Pyrrhula pyrrhula*	Amber List NERC S41	1	1000m East
House sparrow *Passer domesticus*	Red list NERC S41	1	1000m East

* Key to Conservation Status: WCA – Wildlife & Countryside Act 1981 (as amended), SCH1/2/3 – Birds listed on Schedule 1/2/3 of the Wildlife & Countryside Act 1981 (as amended), NERC- Natural Environment and Rural Communities Act (Section 41), ECCD- European Communities Council Directive on the Conservation of Natural Habitats and Wild Fauna and Flora (Annexe 4), Red List- IUCN Red List 2001, BOCC – Birds of Conservation Concern 4 (red/amber)

Habitats

9.4.3 Locations of habitats and target notes are illustrated on Figure 9.2. Table 9.10 describes the intrinsic nature conservation value of habitats recorded within the Site. Further description of all habitats identified within the Site is provided in Appendix 9.1. A detailed arboricultural

survey in accordance with BS5837 is provided in Appendix 9.8 (arboricultural assessment considers different factors in valuing trees to hedges and assessment of value therefore differs between the two).

9.4.4 Overall the Site comprises managed agricultural land, with a mix of arable and pastoral field compartments, largely bound by hedgerows, many of which support mature and semi-mature trees, and which form a network through and around the Site. Small areas of other habitats exist including a linear compartment of tussocky grassland, two substantial ditches and a watercourse, more or less seasonal in nature exist, run through the Site, with other smaller field ditches, wood and scrub habitats and a single pond. Bucknell Road bisects the Site towards its south, with hedgerows either side. Surrounding land use includes open fields to the north, east and south, largely also managed as agricultural land. New development adjoins to the north and the existing development of the western edge of Bicester located beyond the A4095 which broadly forms the eastern boundary.

Table 9.10 Summary Description and Evaluation of Habitats recorded

Habitat Type (JNCC, 2010)	Magnitude / Extent	Description	Value
Broadleaved woodland	1.32ha	Adjoining Hawkwell Farm and extends in part along Ditch D1. Mature crack willow *Salix fragilis*, ash *Fraxinus excelsior*, hybrid black poplar *Populus x canadensis,* silver birch *Betula pendula* and aspen *Populus tremula*, with associated scrub including hawthorn *Crataegus monogyna*, hazel *Corylus avellana* and elder *Sambucus nigra.* Limited ground flora and damp in places. Marked as S41 habitat (low confidence) on MAGIC website. Local HPI.	Small diversity of typical species and small extent in Site. Not of particular quality. Not considered likely to meet S41 HPI description criteria. Largely mature, providing habitat longevity/continuity and would take time to re-establish. Association to D1 increases its value above site context although otherwise of inherent localised value only. Located in green corridor within NW Bicester Masterplan GI and landscape strategy (2014) **Local / medium sensitivity**
Dense / continuous scrub	Single linear area 0.69ha	Noted along D1 in the south of the Site comprising a mix of hawthorn; blackthorn *Prunus spinosa* with elder *Sambucus nigra*, and hazel. Bramble Rubus fructicosus limits much ground layer. Includes mature ash and crack willow. Goat willow *Salix caprea* and bramble scrub located around P10.	Limited diversity of common and widespread species and small extent within Site. Not of particular quality. Provides localised habitat interest within the Site. Whilst not appreciably enriching the wider area, the larger extent present in the south adjoins watercourse corridor linked to the wider area. Located in green corridor within NW Bicester Masterplan GI and landscape strategy (2014) **Local / low sensitivity**
Scattered scrub	Scattered and along two ditches 0.2ha	Present across Site at boundaries, and along linear features, notably D1 and D3 as occasional outgrowths, largely comprising bramble *Rubus fructicosus agg.*	Ubiquitous habitat comprising common and widespread species. Limited extent in site Some located in green corridor within NW Bicester Masterplan GI and landscape strategy (2014) **Negligible**
Individual Trees	Scattered throughout hedgerows	Mature and semi-mature hedgerow trees, predominantly ash, with occasional English oak, as well outgrowing canopy species managed as trees including field maple A*cer campestre* and hawthorn	Overall limited diversity of species, with a good proportion of trees which have not reached maturity. Provide structural interest within context of Site and contribute to the wider resource of tree cover. More

Habitat Type (JNCC, 2010)	Magnitude / Extent	Description	Value
	and linear features	with occasional non-native or introduced species. Several outgrown hedgerows have now established as tree lines.	mature trees represent habitat continuity and longevity. Some located in green corridor within NW Bicester Masterplan GI and landscape strategy (2014) **Local / medium-high sensitivity**
Tall herb & ruderal	Scattered Linear margin 0.25ha	Small patches across the Site, associated with disturbed areas and as a wide margin (1-2m) adjoining D3. Typically dominated by common nettle *Urtica dioica*, with other species such as greater willowherb *Epilobium hirsutum* and creeping thistle *Cirsium vulgare*	Ubiquitous habitat comprising common and widespread species **Negligible**
Standing water	Single pond 0.01ha	Small pond (15m x 10m) at field corner overshaded by scrub. Limited aquatic vegetation associated. Supports great crested newts. Ponds are a local and S41 habitat.	Of limited intrinsic value in itself. Some connection via scrub and nearby hedgerows to other habitats. Not considered to meet S41 HPI description/criteria. **Below local / low sensitivity**
Arable and field margins	102.64ha	Dominant habitat on site. Narrow field margins (typically <0.5m) dominated by coarse grasses including false oat grass *Arrhenatherum elatius* and cock's-foot *Dactylis glomerata*, with cow parsley *Anthriscus sylvestris ,* broadleaved dock *Rumex obtusifolius* and hogweed *Heracleum spondylium* Arable margins are a local &S41 HPI.	Intensively managed habitats and without rare or notable arable weeds. Not considered to meet S41 HPI description/criteria. **Negligible**
Improved grassland	22.72ha	Managed including by grazing. Low diversity dominated by species indicative of agricultural improvement including perennial rye grass *Lolium perenne.*	Homogenous habitat of low species diversity. **Negligible**
Poor semi-improved grassland	46.95ha	Managed including by grazing. Low diversity dominated by species indicative of agricultural improvement	Homogenous habitat of low species diversity. **Negligible**

Habitat Type (JNCC, 2010)	Magnitude / Extent	Description	Value
		Compartment north of D2 comprises tussocky grassland with abundant cock's-foot *Dactylis glomerata.* Locally abundant patches of tufted hair grass *Deschampsia caespitosa* and soft and hard rush *Juncus effusus* and *J. inflexus.* Wild angelica *Angelica sylvestris* among the species rarely recorded.	Low diversity of common and widespread species of inherently low value, but provides some localised habitat diversity adjacent to other semi-natural habitats. **Below local / low sensitivity**
Hedgerows	41 hedgerows 12.24km	Mix of managed and unmanaged features, typically at least 2m in height and width and frequently higher. The majority had less than 10% or no gaps and had a hedge bank and/or dry field ditch associated. Species diversity was low - moderate, with may hedgerows supporting an average of at least 3 species per 50m, typically hawthorn and blackthorn with ash, English elm *Ulmus procera,* elder, hazel and field maple all recorded. Three hedgerows were species rich with more than 5 species per 30m. Three hedgerows assessed as Important under the Hedgerow Regulations 1997 (wildlife criteria). 12 hedgerows considered to be of hig value under the non-statutory HEGS, scoring at least grade 2. Ground flora was limited and largely comprised species similar to the adjoining field margins. Many supported trees. Many showed evidence of historical laying. A number of defunct and outgrowing hedgerows were also present, no longer regularly managed, forming more or less gappy features and tree lines.	Provides a good network of mature features offering foraging and sheltering habitat for a range of fauna, including protected and notable species recorded at the Site. Varying in species diversity, but most of moderate diversity. Provide connectivity through the managed habitats and connect with semi-natural habitats off site and within the local area and form part of the wider hedgerow network. Local and S41 HPI. **Local / medium sensitivity**

Habitat Type (JNCC, 2010)	Magnitude / Extent	Description	Value
		Low hedgebanks and small dry ditches were frequently associated. Although several had significant gaps, many had few. Hedgerows are a local BAP species and a Habitat of Principal Importance under S41of the Wildlife and Countryside Act. Whilst most were of moderate nature conservation value (HEGS grade 3), seven were assessed as being at least moderately high nature conservation value (grade 2 or above) and three were considered likely to be Important under the Hedgerow Regulations, largely those adjacent to PROW, including the towpath of the Grantham Canal.	
Water courses	Three 2.17ha	A small stream D1, forming a tributary of the River Bure (D3) flows through the site, extending north from the railway line, below Bucknell Road to flow east, leaving the Site along the eastern boundary where it joins D3 the River Bure then passing below the A4095. A largely steep sided channel, around 1.5m wide and 1m deep it had a slity mud base with vegetated banks, similar to the field margins, in soemn places overgrowing the channel. Within the channel, fool's watercress *Apium nodium,* water figwort *Scrophularia* a a bur reed *Spargonium* sp. were among the wetland and damp tolerant species recorded. Mature trees and scrub lined the bank tops. Evidence of cattle poaching at some pints were bank - sides were less steep. Water levels fluctuated across the surveys and were not noted to be more than around 5cm deep at most on occasion. Two seasonally wet ditches occurred, bisecting the site in the north (D2) and east (D3). D3 forms a section of the River Bure. D2 converges with D3 in	Species recorded common and widespread and typical of habitat. Not of particular note of quality, although provides one of the few wetland habitats on Site and likely to provide interest to range of fauna using the Site, including as a movement and foraging corridor. None considered to be of particular quality such that they are characteristic or optimal examples of the S41 rivers habitat. The River Bure to flows beyond the site and into the Bure Park LNR, feeding into wider Ray catchment beyond Bicester. Located in green corridor within NW Bicester Masterplan GI and landscape strategy (2014) **Local / low sensitivity**

Habitat Type (JNCC, 2010)	Magnitude / Extent	Description	Value
		the north east of the Site. Both were steep sided and around 1m in depth. Bases where visible were mud. D2 was heavily overgrown with ruderal herbs including common nettle *Urtica dioica* and great willowherb *Epilobium hirsutum.* Brooklime *Veronica beccabunga* was also present within the channel. D3 was overshaded by the adjoining hedgerow to its west and was similar frequently overgrown with vegetation including reed canary. Rivers are a S41 and local HPI	

Fauna

Bats

9.4.5 Full details are provided in Appendix 9.2 Two seasonal surveys (summer and autumn) were undertaken in 2020 on a smaller area than this Application red line. The September 2020 static detector survey recorded barbastelle *Barbastellus barbastellus,* an Annex II species as listed on the Habitats Directive. Effort was therefore upgraded in 2021 to monthly survey effort, with transects extending to 3 hours in time in accordance with guidance, with a dusk and dawn survey undertaken on one occasion. At this time the Application red line increase and an additional transect route was added.

Table 9.11 Summary Description and Evaluation for Bats

Extent	Description	Site / Species Evaluation
Species assemblage and activity		
8 species across Site	Intensively managed farmland supports limited botanical diversity unlikely to attract invertebrate prey. Linear features provide a good network of corridors of greater value as both foraging and commuting habitat, with links to the local area including to small areas of woodland. Hedgerows support mature trees, a small number of which provide roosting features. Results so far indicate the Site is used by a relatively low number of bats given its size, dominated by the more common species Whilst activity was noted across the whole Site, activity was higher along the three ditch habitats D1, D2 and D3. Species recorded predominantly comprised common pipistrelle, a generally common species with widespread distribution 4 S41 species and local SPI (soprano pipistrelle, noctule, brown long eared bats barbastelle) recorded foraging and commuting during transect and static surveys Low numbers of two Annex II species recorded (barbastelle and serotine *Episesicus serotinus*) recorded on static	Overall the site's habitats are of low-moderate value for bats, with large areas of low value habitat interspersed and bisected by smaller or linear habitats of greater value. Habitats of greater interest to bats were noted to be the three water course corridors. The small woodland block provides some suitability for barbastelle bats, including with the associated presence of the water course D1, but its small size and general lack of fully mature trees limits its value. On the basis of existing data for 2020/2021 the overall assemblage and frequency is not considered exceptional or significant, typical of the habitats recorded. Habitats indicating higher levels of use, and therefore of better value to bats, were as would be expected. Numbers of the less common Nathusius' pipistrelle and Annex II bats recorded to date are not considered significant. The northern area were greater numbers of Barbastelle bats were recorded on one occasion is to be retained as GI. The site lacks potential roosting habitat and limited foraging habitat for these species and males of all three species are known to forage and/or migrate over large areas. These species add value but to date have not occurred in sufficient numbers or with sufficient regularity to be significant and the limited suitable habitat for these species suggests the site is not likely to form an important part of their foraging resource, largely providing commuting habitat moving between other more suitable habitats in the wider area. Similar and more suitable foraging and bat habitat is present in the local area which could be readily utilised by the foraging and commuting bats recorded. **Local / low sensitivity for most species** **Local / medium sensitivity (barbastelle)**

Extent	Description	Site / Species Evaluation
	detectors, although September 2021 recorded higher numbers of barbastelle bats on the unit in the north of the Site. Oxfordshire is likely to be on the northern edge of Serotine, with barbastelle typically recorded in southern and central areas. Low numbers of the less common Nathusius's pipistrelle *Pipistrellus nathusuii,* a migratory species recorded across the UK Surveys in 2020 and 2021 showed broadly similar patterns of findings, although more barbastelle bats recorded in 2020, in unit located along D1 Full protection of individuals and places of shelter/roost under EU and UK law.	
Potential roosts		
Eleven trees	Majority of trees not of sufficient maturity to support suitable roosting features. With the exception of M1 and M10 all trees offering potential located south of D1 along mature hedgerow lines. Five trees aerially assessed (T3 – T7) as likely to be removed. Final assessment including following aerial assessmet: T2 - high potential T1, T3, T5 – T6, T8, T9 moderate potential T4, M1, M10 – low potential T7 - negligible	Limited potential roost availability overall and likely presence of similar roosting habitat in local area. Of trees aerially assessed no evidence of roosting noted within potential roost features. Nocturnal survey required on T3, T5, T6 during May – August **Below local / low sensitivity**

Amphibians including Great crested newts

9.4.6 Full details of the great crested newt surveys are provided in Appendix 9.3. Figure 9.3 provides locations of all ponds.

Table 9.12 Summary Description and Evaluation for Amphibians

Extent	Description	Site / Species Evaluation
Linear features, dense scrub, woodland, one field compartment Medium population of GCN in single extant pond.	Much of the site of limited value to amphibians being without a varied structure. Hedgerows provide a good network of movement around and through the Site to the local and wide area, as well as wintering and shelter habitat. Dense scrub and to a lesser extent scattered scrub, woodland and the tussocky grassland to the north of D2 provide foraging and sheltering habitat. Aquatic potential breeding habitat in the form of P10 located towards the south of the Site, supporting a small (peak count of 10) GCN population. Survey limitation suggest a precautionary approach should eb adopted that a medium population at the lower end of the scale could be present. Small populations of GCN recorded in four ponds greater than 500m from P10 (P2, P7, P8 and P13), with an overall peak count indicating a medium meta population across these off-site ponds, which lie within 500m of each other. Two ponds (P7 and P13) supporting small individual populations of GCN lie within 250m of the Site and GCN from these ponds could be using suitable features within the site, up to 500m from the ponds. The other ponds supporting GCN are considered to be sufficiently separate from the site that GCN would not be using it. Large populations of GCN are known to be present in the wider area, at Ardley Cutting SSSI and Bure Park in ponds either over 500m from the Site, or separated from it. Small numbers of smooth newt also recorded at P10 (peak count of 2). Small number of common frig and common toad recorded at surrounding ponds.	Small areas of suitable terrestrial foraging and sheltering habitat within the overall context of site and surrounding area. Good habitat connectivity with surrounding area along hedgerows. Larger more optimal habitat on site is almost 500m from off-site populations reducing its value to these populations. Likely medium GCN population recorded on site at single pond P10 on site, likely using surrounding hedgerow, scrub and woodland habitats up to 500m from it including near Hawkwell Farm. P10 located over 500m from tussocky grassland in north of site and over 500m from closest pond and other areas of more optimal off-site habitats, indicating these are unlikely ot be value to the newts at this pond. GCN known to be widely present in local and wider area and on site population represents small numbers within the wider population in the local area. **Local value / low sensitivity**

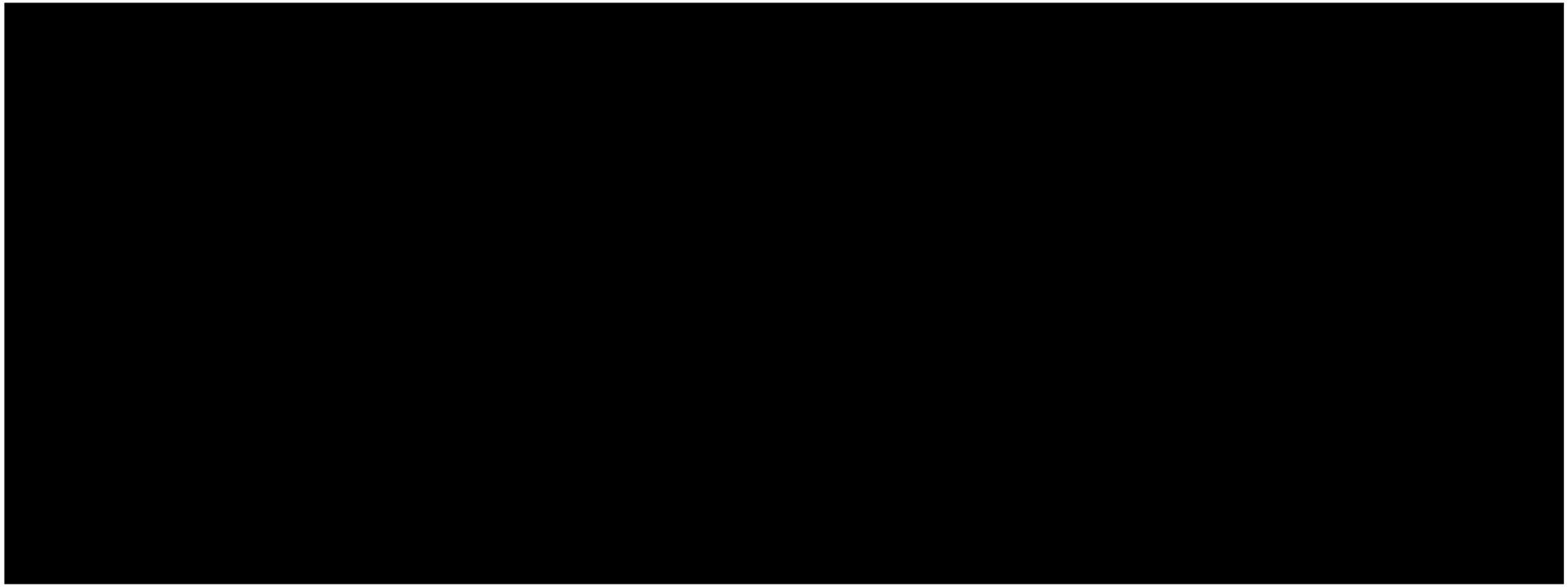
Extent	Description	Site / Species Evaluation
	Full protection of individuals and places of shelter under EU and UK law. S41 listed and local SPI species.	

Reptiles

9.4.7 Full details are provided in Appendix 9.4

Table 9.13 Summary Description and Evaluation for Reptiles

Extent	Description	Site / Species Evaluation
Linear features, dense scrub, woodland, one field compartment	Much of the site of limited value to reptiles being without a varied structure. Hedgerows provide a good network of movement around and through the Site to the local and wide area, as well as wintering and shelter habitat. Dense scrub and to a lesser extent scattered scrub, woodland and the tussocky grassland to the north of D2 provide foraging and some sheltering habitat. Survey recorded no reptiles present on Site Incidental record of one grass snake *Natrix helvetica* approxinatley 200 northwest of site during GCN surveys. Desk study grass snake and common lizard *Zootoca viviparus* in wider area, with limited connection to site. Protection of individuals only under UK law S41 and local SPI	No reptiles recorded on site. Habitat unsuitable to support a viable population of reptiles without sufficient varied structure to provide habitat throughout life-cycle. Habitats could provide foraging and shelter for individual grass snake known to be present in the local area and which have a wide foraging range. Further suitable habitat widely present in local area. **Below local / low sensitivity**



Birds

9.4.9 Full details of the breeding bird surveys are provided in Appendix 9.6 and Appendix 9.7

Table 9.15 Summary Description and Evaluation for breeding and wintering birds

Extent	Description	Site / Species Evaluation
Breeding Birds		
22 notable species recorded on site.	Species typical of habitats recorded. Internal arable field compartments provided breeding habitat for several notable ground nesting farmland birds,	Site does not meet any LWS criteria for birds. Lower-moderate numbers of breeding or probable breeding notable species recorded using suitable

Extent	Description	Site / Species Evaluation
3 notable bereding birds (species lapwing *Vanellus vanellus*, starling *Sturnus vulgaris* and bullfinch *Pyrrhula pyrrhula* 11 notable probable breeders red like *Milvus milvus* mallard *Anas platyrhynchos*, grey partridge *Perdix perdix*, kestrel *Falco tinnunculus*, skylark *Alauda arvensis*, willow warbler *Phylloscopus trochilus*, song thrush *Turdus philomelos*, dunnock *Prunella modularis*, yellow wagtail *Motacilla flava*, linnet *Linaria cannabina* and yellowhammer *Emberiza citrinella*	as well as foraging for notable farmland species, including lapwing, skylark, yellow wagtail and meadow pipit. Marginal areas provide breeding and foraging for small numbers of notable farmland specialists such as grey partridge, yellowhammer and linnet, which would also use the compartments for foraging. Modified grassland provides foraging for a small number of the notable species recorded, including meadow pipit, song thrush and starling. Notable species using hedgerow and wooded areas for breeding and foraging included willow warbler bullfinch and dunnock. Mallard were noted as probable breeders within the watercourses.	habitats. Abundant similar habitat widely available in surrounding area Breeding bird assemblage including farmland and more generalist species: **Local value / low sensitivity** Individual species: majority of species recorded in numbers that are not of significance beyond **local level**. Whilst only one pair of lapwing was confirmed as breeding on Site within farmland habitats, breeding pairs within Oxfordshire are declining, with less than 10 pairs annually. Lapwing: **county value / medium sensitivity**
Wintering Birds		
24 notable wintering species recorded Mallard; teal *Anas crecca*; grey partridge; stock dove; lapwing; snipe *Gallingao gallinago;* Black-headed Gull *Chroicocephalus ridibundus;* Lesser Black-backed Gull *Larus fuscus;* Red Kite; Skylark; Kestrel *Falco*	Majority of species typical of habitats. Farmland habitats recorded generally provide good foraging resources for notable species, with interiors providing foraging for a range of widespread but declining species, including the gulls, birds of prey and thrushes recorded. Hedgerows provided foraging for notable generalists with some resting and communal roosting habitat within hedges for linnet and yellowhammer. Woodland also provided roosting and foraging.	The site did not meet any LWS criteria for wintering birds. Grey wagtail met the threshold value, but the survey cannot confirm regularity of use over required frequency (3 out of 5 seasons). Low-moderate numbers recorded of a typical range of notable species for all habitats. Similar habitats abundant in local area. Assemblage for farmland and generalist habitats: **Local value / low sensitivity**

Extent	Description	Site / Species Evaluation
tinnunculus; Starling; Song Thrush; Mistle Thrush *Turdus viscivorus;* Redwing *Turdus iliacus;* House Sparrow; Dunnock; Grey Wagtail *Motacilla cinerea;* Bullfinch; Linnet; Yellowhammer	A wintering colony of house sparrow occurs at Hawkwell Farm, with wetland areas used by forgaing mallard and snipe.	Individual species: majority of species recorded in numbers that are not of significance beyond **local level /low sensitivity** Numbers of grey wagtail meet LWS annual threshold, peak count of 3 on one of four survey occasions. Grey wagtail: **County level / low sensitivity**

Other species

9.4.10 The Site supported limited habitat for other protected and notable species.

9.4.11 Watercourses were not considered suitable for water vole *Arvicola terrestris*, having fluctuating water levels and a generally shallow depth of water noted. No evidence suggesting their presence was noted and no records were returned as part of the desk study. This site is considered to have negligible value for this species.

9.4.12 Watercourses did not provide habitat suitable for either foraging or habitation by otter *Lutra lutra.* These linear features could provide potential as commuting habitat for individuals moving around their home range and between suitable water courses. However no evidence of otter, including spraints was noted and no records of otter in the local area provided. This site is considered to have limited value for this species.

9.4.13 Watercourses did not provide suitable habitat for white-clawed crayfish *Austropotamobius pallipes,* largely comprising mud substrate and without the rocks and pebbles preferred by this species. No records were provided. This site is considered to have negligible value for this species.

9.4.14 Hedgerows provided limited suitability for dormice *Muscardinus avellanarius,* with few hedgerows supporting any hazel within their canopies and where present, comprising only a small proportion of the composite species. No records of dormice were provided for the area and the Site is considered to be of negligible value for this species.

Important Ecological Features (IEF)

9.4.15 Table 9.16 identifies those habitats and species recorded at the Application Site evaluated as being of local or above value and which are therefore classified as IEF. Features identified as having below local value are not considered IEF and are not assessed further. In some instances, due to the legal protection afforded to fauna, appropriate measures to avoid or mitigate harm to individual species are described, although they may not be considered to be IEF themselves due to the low value of the Site to them and/or small numbers recorded.

Table 9.16 Important Ecological Features associated with the Application Site

Important Ecological Feature		**Value**
	Within Zone of Influence	
Designated Sites	Ardley Cutting and Quarries SSSI; Ardley Trackways SSSI; Stratton & Audley Quarries SSSI	National
	Bure Park LNR	County
	Ardely and Heyford CTA; Tusmore and Shelswell Park CTA	County
	Bicester Airfield LWS	County
	Skimmingdish Lane Balancing Pond CDWS and pCDWS	Local
	Deciduous woodland & woodpasture parkland HPI	Local
	Within Application Site	Local
Habitats	Broadleaved woodland	Local
	Dense / continuous scrub	Local

Important Ecological Feature		Value
	Individual trees	Local
	Hedgerows	Local
	Watercourses D1-D3	Local
Fauna	Breeding Lapwing	County
	Wintering grey wagtail	County
	Foraging and commuting bats	Local
	Great crested newts	Local
	Farmland and generalist bird breeding overall assemblage;	Local
	Individual breeding species: grey partridge; skylark; starling; song thrush; house sparrow; yellow wagtail; linnet; yellowhammer; mallard; kestrel; willow warbler; dunnock; meadow pipit	Local
	Farmland and generalist bird wintering overall assemblage	Local
	Individual wintering species: grey partridge; skylark; song thrush; mistle thrush; redwing; fieldfare; starling; house sparrow; linnet; yellowhammer; stock dove; black headed gull; lesser black backed gull; kestrel; meadow pipit; dunnock	Local

Future Baseline Conditions (Do Nothing Scenario)

9.4.16 Designated sites in the local area are unlikely to be affected by the continuance of the Site without the proposed development any more than currently.

9.4.17 In the absence of the development, it could be assumed that the Site will continue to be managed as agricultural land and much of it would therefore experience limited change, continuing to support an overall low biodiversity value for wildlife across the managed habitats. Depending on management practices, all ditches could become increasingly overgrown with ruderal vegetation and scrub, further decreasing the extent of flowing water and removing any suitability for riparian flora or fauna, decreasing their value as connective habitat for use by wetland fauna, although could increasingly provide foraging and shelter habitat for terrestrial or airborne species/phases. Unless managed as part of the farm practices, hedgerows would be expected to become increasingly outgrown with a consequent decrease in form and structure over time although would be likely to continue to have some value as habitat corridors, foraging and shelter at least in the short-medium term for fauna. However in the longer terms, as shrubs grow out structure would become increasingly gappy and start to lead to a discontinuous and fragmented line reducing their value as a movement corridor and ultimately decreasing their value for foraging and shelter, with a consequent reduced resource available. Trees, in the absence of active management, would likely deteriorate in health and quality as they became over-mature. Whilst their value as foraging and shelter habitat for current fauna, including birds would be expected to decrease in value as a result of ageing and poor condition, in the short-medium term this might provide some increased potential bat roosting habitat, until condition deteriorated significantly and led to branch/tree collapse. Increases in dead wood availability might favour a localised range of saproxylic flora and fauna, unlikely to be present currently. Ephemeral and ruderal areas if

left unmanaged as currently would succeed to more established grassland in the short-medium term and scrub habitats over longer time.

9.5 Assessment of Likely Significant Effects

Construction Effects

Impact on Designated Sites

9.5.1 The Proposed Site lies within 400m of the westernmost extent of the Ardley Cutting and Quarry SSSI. The only development category which the Site falls into within the Natural England Impact Risk Zone for this SSSI, is *residential developments of over 100 units*. There are anticipated to be no adverse effects on the SSSI as a result of construction activities, given its distance from the Application Site.

9.5.2 Bure Park LNR lies less approximatley 20m east of the Application Site initially as a linear feature along the River Bure, with the larger area of more open habitats, lying over 500m from it. Whilst the A4095 passes between the two, the three onsite watercourse converge to flow directly into the LNR culverted below the road. There is some potential for adverse effects on this designated site as follows:

- Habitat degradation arising from dust and particulate deposition;
- Accidental pollution, including through sediment loading and contamination

9.5.3 Ground clearance, including soil stripping and earth movements have the potential to lead to increase in airborne dust, particularly during dry weather periods, damaging vegetation and dependent fauna. The Institute of Air Quality Management has produced guidance on the assessment of dust deposition. This notes that sites such as LNR are classified as being low sensitivity to effects of dust deposition and states a maximum distance of risk at <20m and at a low risk level. It is therefore considered that there will be negligible effects on this LNR as a result of airborne particulates arising during any stage of the construction process including ground works, construction and trackout.

9.5.4 Accidental pollution arising from site works has the potential to lead to adverse effects on flora and fauna at the LNR, via the hydrological connection along the River Bure through pollution arising from accidental spillages into the watercourses at the Site and increased sediment loading arising during earthworks and some construction activities. Habitats within the Site are not considered to be of high value or particular sensitivity, but where they lie within or adjoin the river could be adversely affected. A population of great crested newts exists within small ponds at the LNR fed by the Bure and could be affected both by decreased water quality, including changes to oxygen and nutrient levels as a result of contaminants and by increased sedimentation in open water, affecting the ability of individual newts to survive within the water and affecting the plants which may be used by newts during their

life-cycle. Ponds within the LNR are located around 500m downstream of the Site, off the main river channel and a small tributary.

9.5.5 In the absence of appropriate mitigation these effects are assessed as being temporary/periodic short-term negative impacts on the LNR, affecting a small proportion only of the terrestrial features and affecting the length of the aquatic habitats within it, albeit at a decreasing level through it to the due to progressive effects of dilution and for short periods. They are therefore of a minor magnitude, assessed as being of **minor significance at a Local level**, unlikely to affect the overall integrity of the designation.

9.5.6 All other designations are considered sufficiently separate or distant from the Application Site that there are anticipated to be no adverse effects during construction.

Impact on Habitats

Habitat loss

9.5.7 The majority of losses are to habitats not assessed as being IEF, including arable, improved and species poor semi-improved grassland, scattered scrub, tall herb and ruderal vegetation.

9.5.8 Habitat losses of IEF are restricted to hedgerows and their associated trees, as a result of total or partial removal to accommodate primary access roads or location within proposed built areas. Two hedgerows may be lost in full and are both assessed as having non-statutory nature conservation priority under HEGS, scoring grade 2 or above, with one being considered species rich with at least 5 species per 30m. A further 11 are anticipated to have breaches largely for access roads. Of these, six are assessed as having high value under HEGS, with three being species rich. Two are considered to be Important under the Hedgerow Regulations. All are S41 HPI. A total of 1.4km hedgerows are likely to be lost, equating to around 11% of the overall resource at the Site.

9.5.9 Effects would be permanent adverse losses and/or fragmentation within the hedgerow network, across several single events. Overall the losses are such that much of the existing network will be unaffected and its functionality within and contribution to the Site's hedgerow resource, and local hedgerow network unlikely to be adversely affected. These effects are therefore considered to be of a minor magnitude and of **minor significance at a below local level.**

Table: 9.17 Effects on hedgerows

Ref	Grade	Potential effect	Reason
H12	2+	Total loss	Playing fields/open space.
H22	2	Total loss	Primary road/built development
H1	3+ / species rich	Partial loss	Primary road
H9	3+ / species rich	Partial loss	Primary road
H13	-2	Partial loss	Primary road

Ref	Grade	Potential effect	Reason
H14	3	Partial loss	Primary road
H16	+3	Partial loss	Primary road
H19	+2	Partial loss	Primary road
H20	-2	Partial loss	Primary road
H21	3	Partial loss	Primary road
H24	-1 / Important / species rich	Partial loss	Primary road
H27	-3	Partial loss	Primary road
H28	+3	Partial loss	Playing fields/primary road
H31	2 / Important	Partial loss	Primary road
H32	-2	Partial loss	Primary road
H35	+3	Partial loss	Primary road
H36	+2	Partial loss	Primary road

9.5.10 D1 and D3 will be crossed by small road crossings, bridging the watercourses enabling maintenance of the natural water course and bed. There would be some localised habitat loss associated with bankside vegetation and scrub during works and potentially affecting any in-channel vegetation at these points but the main corridor will be otherwise retained, with structural features associated with the crossings expected to be outside the water corridor within non-IEF habitats.

9.5.11 Effects of habitat loss associated with these bridges will be permanent adverse losses and fragmentation of the associated riparian habitats, across two single events and at a small scale affecting only small proportions of the retained watercourses. Loss of any flora as a result is not considered significant as the watercourses are not of inherent botanical value, with their main value relating to their functionality and location within existing green corridors and as such, the nature and extent of losses are such that the overall integrity and functionality of the watercourse will be retained.

Habitat disturbance

9.5.12 Ditches D1 and D3 will be subject to disturbance during works to create the crossings. All retained IEF, including D1 and D3 have the potential to be affected by works generally. Disturbance effects may include:

- Habitat disturbance and degradation, such as through accidental ingress leading to physical damage
- Habitat degradation arising from dust and particulate deposition;
- Accidental pollution, including through sediment loading of water bodies.

9.5.13 Ground clearance, including soil stripping and earth movements have the potential to lead to increase in airborne dust, particularly during dry weather periods, damaging vegetation and dependent fauna. Effects would occur upon only on IEF where they abut and are in

proximity to active work areas. As the majority of IEF are either linear or small scale in extent, there is potential for the majority of IEF to be affected.

9.5.14 Retained vegetation could suffer from damage, including soil compaction and physical damage along the edges of habitats arising from ingress of machinery and works whilst construction works are in the vicinity of these habitats and as such effects would be periodic. Prolonged physical damage can however lead to the irreversible and long-term deterioration of habitats.

9.5.15 Accidental pollution arising from site works, including spillages and for water courses, sediment loading in proximity to an IEF, has the potential to lead to adverse effects on flora and fauna both within the immediate locality, although effects would lessen with distance as pollutants became diluted.

9.5.16 Given the likely phased nature of works, only sections of the IEF on site would be anticipated to be affected at any one time. In the absence of appropriate mitigation these effects are all assessed as being temporary/periodic short-term negative impacts. They are therefore of a minor magnitude, assessed as being of **minor significance at a local level**.

Impacts on Fauna

9.5.17 Potential effects on fauna identified as IEF could arise as a result of:

- Loss of habitat used for foraging, breeding and shelter
- Loss of habitat used for commuting leading to isolation and fragmentation of habitats
- Disturbance to these habitats
- Harm or mortality of individuals using these habitats during works

Bats

9.5.18 Losses of managed arable and grassland habitats are considered unlikely to adversely affect bats using the site, given their limited value as foraging habitat to this group.

9.5.19 The creation of access routes through linear features will lead to the interruption of such features used for movement. Losses associated with construction access are anticipated as being sufficiently small that most common bat species recorded at the site would continue to cross these gaps to move around and through site to foraging and roosting habitats in the local and wider area and these are not significant.

9.5.20 Losses associated with hedgerow breaches and D1 and D2 for the purpose of primary access roads created during construction may lead to adverse effects for foraging bats. Lower levels of activity tended to be seen across the central part of the Site, where hedgerows bisect the lower quality habitats, and where most of the hedgerow breaches will be made, with losses therefore occurring largely to lesser used hedgerows. The hedgerows to be lost in the south east did have some increased activity compared to other hedgerows possibly linked to the

presence of D1 and the woodland block in this area, and this area will include three branches of the new primary roads and built development, reducing foraging habitat in this area.

9.5.21 Effects of habitat loss on foraging bats are assessed as being a permanent, low magnitude, over several occasions and are a **minor adverse effect and not considered significant** given the small scale of loss of suitable foraging habitat in the context of that retained and in the wider area and unlikely to adversely affect the Favourable Conservation Status (FCS) of any bat species recorded at the Site.

9.5.22 Loss of the linear habitats above arising from the above will lead to the interruption of such features used for movement. Overall bat activity was not considered to be exceptional, including along those corridors identified as being of more value to bats with the assemblage using the habitats generally typical and only small numbers of more rare bat species recorded on most occasions, with higher numbers of barbastelle recorded during one static detector survey on one survey occasion along a corridor to be incorporated as a green corridor within the GI.

9.5.23 Hedgerows within the GI will be retained, ensuring these habitat corridors continue to provide alternative flight lines around the Site, including along the Site's peripheral areas which link to off-site habitat but there is potential in the absence of mitigation for fragmentation or isolation of foraging and/or potential roosting habitat used by bats along the water courses and to the south east particularly. For the majority of hedgerow breaches, activity recorded was low and these were not considered key foraging routes. Whilst the two hedgerows in the south east were among the more well used habitats, they do not provide key linkages between significant habitat areas on or off-site. The creation of vehicular crossings across the two water-courses, where greater activity was prevalent has the potential to disrupt flightiness and lead to some isolation from potential foraging and roosting habitat, both on site, including all three water-courses and the woodland block immediately east of Hawkwell Farm, as well as woodland and water courses in the local area.

9.5.24 Effects of fragmentation and isolation would be permanent, of a low magnitude and of **minor significance at a local level**, unlikely to affect the FCS of the local population.

9.5.25 If construction occurs outside of daylight hours, the use of high intensity lighting has the potential to adversely affect the ability of bats to forage and move around the site, but would not be expected to affect the whole site at any one time. Effects during construction would be unlikely to affect the FCS of the local bat population and are considered to be temporary, periodic, of a minor magnitude with not all areas affected at any one time, and are of **minor significance at a below local level.**

Great crested newts

9.5.26 The single pond supporting great crested newts will be retained. There will be limited loss of habitat likely to be used by the population at this pond, as much of the surrounding habitat comprises cropland and pasture of limited suitability for GCN. Habitat loss will be restricted

to breaches within hedgerow habitats within 500m of the pond and the loss of a small linear section of the southern edge of an area of scrub also for an access road. All breaches are greater than 50m from the pond outside the high impact zone. Losses in themselves are unlikely to reduce the overall extent of foraging and sheltering habitat with only small areas lost in the context of the retained habitats, with those closest to the pond unaffected including the majority of the scrub area connected to the pond by a hedgerow. Losses associated with hedgerow breaches will however have the potential to lead to adverse effects through potential fragmentation and isolation of the population from suitable habitats, in the absence of mitigation. The pond is more than 500m from the nearest other pond (P7) in the area, which is almost 700m to the east in a direct line, or approximately 900m via suitable connective habitat. GCN have been recorded in P7,but is considered likely to be part of a different local population given the distances between the two and there are considered no effects of isolation from other potential aquatic habitat for GCN at either pond as a result. No significant foraging or habitat areas are located within 500m of P10, with the small area of scrub and the small woodland block to the north and south of Hawkwell Farm respectively being the closest areas of suitable habitat, with only partial/indirect links along field edges to the woodland block.

9.5.27 GCN are widely present in the local and wider area, with several known and separate populations within 2km of the Site, with the closest pond P7, around 200m directly west of the boundary, with connections to suitable terrestrial habitat on the eastern edge of Bucknell, where further ponds supporting GCN occur east and west of Bainton Road, also with connected access to larger areas of more suitable terrestrial habitat than those within 500m of these ponds at the Site. As a result it is considered that GCN at the off-site ponds would be generally unlikely to use the small areas of less suitable terrestrial habitat at the Site lying within 500m of these.

9.5.28 Adverse effects of fragmentation and isolation are permanent, and likely to be across several events given the phased nature of works of a low magnitude and are considered to be **of minor significance at a below local level all GCN recorded**, on or off-site.

9.5.29 There is the potential for harm or mortality to any GCN using suitable terrestrial habitats within 500m of any pond supporting GCN to be removed in the absence of mitigation. For off-site ponds, given the low likelihood of GCN being present on Site, effects are not considered to be significant and unlikely to affect the local FCS of the populations. For GCN at P10 on site, adverse effects are considered to be of a low magnitude, permanent, occurring as one or several events dependent on phasing and **of minor significance at a below local level**, potentially affecting small numbers of the population associated with P10, particularly where directly connected suitable habitat within 250m is removed but unlikely to affect the overall FCS of the wider population.

Breeding birds

9.5.30 The loss of agricultural habitat without mitigation will lead to a total loss of suitable breeding habitat for the IEF lapwing within the Site, since this species require large open fields to breed successfully. A single pair of lapwing was confirmed as breeding at the Site, representing 10% of the overall population of lapwing thought to breed within the county (<10 pairs). This would result in a high magnitude of loss over several occasions given the likely phased nature of works, and would be an adverse effect **of minor significance at a County level,** affecting a relatively small proportion of this population.

9.5.31 The loss of large open fields will likely lead to a loss of skylark and yellow wagtail as probable breeders on site, since these species require this habitat for nesting. For the five IEF species grey partridge, yellowhammer, linnet, kestrel and meadow pipit, farmland habitat to be lost provides a part of their foraging and breeding habitat available at the Site and retained areas will continue to provide foraging and some limited breeding suitability.

9.5.32 Moderate numbers of skylark were recorded on all survey occasions, with the species indicating probable breeding at the Site and effects for this species are therefore considered to be permanent, of a high magnitude and **of minor-moderate significance at a local level.**

9.5.33 For the other six IEF noted above, effects of the loss are considered to be permanent, of a high magnitude spread across several occasions, **of minor significance at local level at most,** with numbers recorded suggesting the site is either not of particularly high value to them for breeding with some lower value potential breeding habitat retained and/or with other suitable widely present in the local area.

9.5.34 The remaining seven farmland IEF specialists listed in Table 9.15 were recorded in relatively small numbers and with the general abundance of similar suitable habitat in the local area, effects are not considered to be significant beyond their immediate context.

9.5.35 Habitat removal also has the potential to lead to mortality or injury of all breeding birds, as all species are protected by law whilst breeding. Effects which would be across several events, permanent adverse, potentially of a high magnitude and **of minor significance at a county level** for lapwing and at a **local level** for other farmland specialists. For all other more generalist species, effects would be at **a below local level.**

9.5.36 Construction works have the potential to lead to disturbance of all birds breeding within the Site at the time, including those yet to be removed and those to be retained. Activities such as vegetation clearance, ground works and other works, such as piling may lead to nest desertion and reduced suitability of nesting habitat for all species. Overall disturbance effects would not be expected to affect the local conservation status of any breeding bird at the Site, and would be periodic, temporary adverse effects of moderate magnitude and of **minor significance at the below local level,** with some suitable habitat likely unaffected at that time.

Wintering birds

9.5.37 The loss of agricultural land will reduce the overall availability of winter foraging resources for the following farmland IEF specialists on site: skylark, grey partridge, stock dove, yellowhammer, linnet, kestrel and meadow pipit. However, the retention / creation of sizeable areas of grassland and scrub along the watercourse corridors and throughout the GI will maintain a limited area of suitable habitat for these species. Overall, it is therefore considered that the effects of habitat loss will permanent of a moderate magnitude and occurring across several events, and will be a **minor adverse effect of significance at a below local level,** possibly higher for grey wagtail, as the wintering farmland bird assemblage on site was recorded in relatively small numbers and the severity of any adverse impact is reduced by the general abundance of similar suitable habitat in the immediate vicinity and in the wider landscape.

9.5.38 Lesser black-backed gull and black-headed gull readily forage within urban areas including recreational grounds and industrial land. The loss of agricultural habitat is therefore anticipated to result in a **Negligible** impact on a local level for these two gull species. The retention of the vast majority of hedgerows and standard trees and retention of all woodland blocks will ensure the development will result in a **Negligible** impact in the short-term on the generalist and woodland species recorded within the site including the locally important house sparrow, mistle thrush, song thrush, redwing, fieldfare, starling and dunnock.

9.5.39 Construction operations including noise, initial ground works and some construction activities during the winter season disturbance may lead to the avoidance of the area by wintering birds and reduce the suitability of retained/unaffected foraging areas. Whilst there is some potential for winter survival to be reduced as a result, this is not expected to affect the local conservation status of birds using the Site for wintering.

Other species

9.5.40 The following provides information regarding potential impacts to species/their habitats which are protected by law but which are not IEF - as such a full assessment of impacts in accordance with EcIA guidance is not made, however regard must be had from a legal perspective.

9.5.41 Bats and their roosts are afforded legal protection at a UK and EU level. Five trees with bat roost potential will be removed associated with hedgerow loss of H12 and H21. These trees will be subject to aerial assessment to ascertain the presence of bats and their removal under NE derogation licence may be required if a bat roost is confirmed. A further four trees have been identified as having potential roosting features, but are not expected to be lost. Should this change these trees would require assessment.

[redacted]

[redacted]

9.5.43 Similarly, reptiles are legally protected from harm under UK law. Whilst no reptiles were recorded during targeted surveys, grass snake are known in the local area and could use suitable habitats on Site. Construction works could lead to the harm or mortality of individual animals which may be using suitable habitats affected in the absence of mitigation. This includes works to linear features including ditches and hedgerows, tall ruderal and scrub areas.

Operational Effects

9.5.44 Impacts once the Site is operational could arise from:

- Increased disturbance to a qualifying species as a result of residential development and recreational activity;
- Damage to sensitive habitats as a result of increased fragmentation, disturbance, trampling, arson and nutrient enrichment or eutrophication;
- Airborne emissions from increased traffic associated with the development;
- Damage to habitats and species as a result of changed hydrological regimes.

Impact on Designated Sites

9.5.45 Bicester Airfield LWS and Skimmingdish Lane CDWS and pCDWS are considered to be sufficiently distant, without hydrological links and/or without public access that no significant impacts would be anticipated at them.

9.5.46 Both Conservation Target Areas within the zone of influence are landscape scale designations for targeted conservation actions, extending to over 800ha each, with only small peripheral extents occurring within the zone of influence. They are also considered sufficiently distant that significant adverse impacts on habitats of value within them would not be anticipated.

9.5.47 Ardley Cutting and Quarries SSSI lies 400m to the west of the Site. Predominantly linear in form extending along the rail line, more open habitats exist at Ardley Wood, around 3.5km west of the Site. There would be anticipated to be no adverse effects as a result of airborne or hydrological effects. There are no direct public rights of way from the Site into this designation, although a public right of way extends from Bucknell alongside part of the designation and crosses through it at Ardley Wood. Given the distance of the designation and lack of direct link it is considered that effects of increased recreation including disturbance and damage to qualifying features of interest would not be significant.

9.5.48 Bure Park LNR lies to the east of the Site. A path extends from the eastern side of the A4095 opposite the south-eastern corner of the Site, following the rail line to join enter the LNR around 600m away, a further public right of way extends from the A4095 north of this, passing through the existing housing and into the LNR. Given the ease of access and close proximity, there is potential for increased recreation at the LNR. As an LNR it is an advertised community resource, managed for both recreational use and biodiversity value, supporting habitats of botanical and biodiversity interest at a localised value with accessible pathways and nature trails throughout. Increased recreation could lead to habitat degradation of habitats of low sensitivity, through trampling by humans and dogs, littering and eutrophication and to the disturbance of the fauna, including birds and the pond's great crested newt population using these habitats. Effects of damage to habitats from trampling is likely to be relatively limited given the network of pathways to use. However the potential for eutrophication, through dog littering and for general littering could still adversely affect these habitats. Effects of habitat degradation could occur on a regular basis and would be a permanent effect, probably of a low magnitude with only those areas closest to accessible parts of the LNR affected and are assessed as being of **minor significance at a below local level**.

9.5.49 Adverse effects arising from changes to airborne emissions are not anticipated given only a very small section of the LNR lies adjacent to the A4095 and habitats not considered to be of particular sensitivity.

9.5.50 The River Bure extends from the Site and into the LNR. Once the Site is operational changes to the hydrological regime have the potential to affect the riparian habitats and feeder pond supporting GCN as well as adjoining habitats which include wet woodland and grassland. Effects are likely to be of low magnitude, affecting only the riparian and pond habitats and small areas of terrestrial habitats adjoining these. Effects could be temporary and/or permanent, occurring either periodically as single events at the Site which affect temporarily affect habitats and features downstream or through permanent change in water levels leading to changes in water table levels which may alter the nature of adjoining habitats and are considered of **minor significance at a local level.**

The Impact on Habitats

9.5.51 Potential effects on retained IEF habitats at the Site arise from changes to the local hydrological regime as described for the River Bure. These could affect the IEF water course D1-D3 themselves and the IEF habitats adjoining - hedgerow, woodland and dense scrub habitats alongside D1 and D3. Effects are likely to be of moderate-high magnitude, affecting large sections of these habitats and could be temporary and/or permanent, occurring either periodically as single events at the Site which affect temporarily affect habitats and features within these IEF or through permanent change in water levels leading to changes in water table levels which may alter the nature of adjoining habitats and are considered of **minor significance at a local level.**

9.5.52 The two new crossings over D1 and D3 could lead to changes in the IEF riparian and associated habitats through altered climatic conditions such as through increased shading and changes to rainfall. Effects would be at a very localised level and considered unlikely to be significant, with much of the feature unaffected.

9.5.53 Once operational all retained IEF habitats will be subject to long term increases in use by both the new community and the existing local community, with open access potentially leading to habitat degradation, including the creation of desire lines. This could lead to permanent adverse effects, across parts of all retained IEF habitats of **minor significance at a below local level.**

Impact on Fauna

Bats

9.5.54 Once operational there is the potential for indirect disturbance to bats through altered lighting regimes, increasing light pollution on new and retained foraging, commuting and potential roosting habitat. This has the potential to lead to changes in emergence and roosting behaviour and the ability for bats to move around the site to use suitable foraging habitat on and off site. Increased lighting could therefore lead to adverse effects on bats using habitats adjacent to the built development and access roads and lit pathways through the GI, although it is noted that some bats species, such as common pipistrelle can adapt to increased lighting regimes, which attract prey items to the light sources.

9.5.55 New roads and junctions may lead to an increase in harm or mortality of bats where these breach new or retained foraging and commuting routes. Bat activity at the site was relatively low, but both D1 and D3 seen to be of greater value to bats will be breached once each. Given the nature of the residential application, nocturnal use of roads is likely to be relatively limited and there will be a low magnitude of change, with alternative flight lines available.

9.5.56 Effects of these would be permanent, and reversible in the case of lighting, and of a moderate magnitude, with some linear features unaffected outside of the built areas. For all IEF bats including the Annex II species Barbastelle, these effects are considered to be a **minor adverse effect at a below local level**, given the low numbers recorded using the Site and the FCS maintained for the local populations.

Great crested newts

9.5.57 Whilst the P10 supporting GCN will be located within an area of green space, the internal road network will cross habitat corridors extending from it. Whilst GCN predominantly move at night, when vehicular activity might be reasonably anticipated to be lower, there is the potential for harm and mortality of individuals moving across roads. In addition kerbed roads and gully pots can lead to entrapment on the road and sewer system. Effects are considered to be permanent, of a low magnitude and of **minor significance at a below local level.**

9.5.58 Effects of increased disturbance to P10 from humans and domestic pets could lead to habitat degradation and pollution could lead to decreases in aquatic habitat and water quality, reducing the ability of the population to breed in the long term. Adverse effects are permanent, of a high magnitude, potentially affecting the single pond supporting GCN on Site and of **moderate significance at a below local level.**

Breeding and Wintering Birds

9.5.59 Once operational there is the potential for disturbance to IEF bird species using the Site's habitats as a result of increased disturbance and predation from domestic pets and corvids. Effects are considered to be **minor adverse significance at a below local level**.

Other species

9.5.60 There is some limited potential for disturbance to the non-IEF badger setts off-site from humans and dogs once the Site is operational where these adjoin accessible open space. Given the distances of the setts from the Site within off-site habitats, this is considered to be negligible.

9.6 Mitigation Measures

Embedded Mitigation in Proposed Development

9.6.1 Early survey of the Site and its surrounds and the identification through survey of those features as having greater biodiversity interest have informed the proposed layout from an early stage feeding into the iterative design process. As a result, the potential effects identified in the section above have been avoided through the retention of features of greater value wherever possible, to form the overall basic framework of the Green Infrastructure (GI), with these features retained as integral components of it.

9.6.2 The GI provides the scope for the mitigation of any necessary losses of IEF, with new planting and habitats alongside the retained habitats, as indicated by the Framework Plan and Green Infrastructure Strategy. This has also ensured that enhancements and a net gain in biodiversity can be achieved at the Site. Overall, the GI proposals include a mix of public open space sports/play areas flood attenuation and semi-natural habitats, integrated with and linked to the existing retained habitats at the Site, which will be restored and enhanced as part of the GI, with GI forming around 40% of Site, in accordance with Cherwell District policy: Bicester 1. GI will provide a habitat mosaic with enhanced habitat connections around the site and will include features of biodiversity value as follows:

- Semi-natural greenspace, incorporating existing and created habitats within a landscape and habitat buffer will extend along much of the northern boundary creating a wider semi-natural corridor in this area of greater potential biodiversity value, incorporating D1. This corridor links at its eastern end to an existing green corridor associated with the River Bure where it extends through development to the

Site's immediate north before linking back into the Site along an enhanced habitat corridor along the River Bure (D2) as it flows south through the Site. Converging with this on the eastern boundary is a further wide habitat corridor which follows D1 through the Site from the southern boundary with the rail line. Together these provide the key habitat linkages through the Development which will contribute to ecological connectivity and biodiversity resilience across the local area linking with existing ecological corridors and designations in the local area.

- The main extent of semi-natural habitat will lie to the west of the Site, forming a Country Park, buffering the wood pasture and parkland HPI to the immediate from the built areas of the development and directly linked to the northern buffer corridor. These habitats would include a mix of new and restored habitats including species-rich neutral meadow grassland (such as of a MG5 *Cynosurus cristatus-Centuarea nigra* type), tussock and inundation grasslands (such as MG4 *Alopercurus pratensis-Sanguisorbia officinalis*), native broadleaved woodland, mixed and willow scrub and wood-edge habitats, and wetland in the form of small wildlife ponds, as well as attenuation features and D1- D3.
- Pond P10, supporting GCN has been incorporated into an area of open space, with green corridors extending from it, maintaining the link with the nearby scrub and woodland blocks at Hawkwell Farm. A green corridor including swales and tussock grassland will connect the pond with the country park where wildlife ponds will provide stepping stone habitats for GCN into the west, where further populations exist.
- The majority of hedgerows and their existing trees provide the basis of a network of smaller green corridors through the built areas, linking with the main habitat corridors and open spaces, with new grassland alongside the hedgerows, creating new habitats and enabling faunal movement around the Site.
- In addition, other more formal aspects of the GI, whilst offering lower biodiversity value, would still contribute to the overall biodiversity value as follows:
    - Smaller green corridors, including alongside existing public footpaths and new access tracks, linking with the more semi-natural areas and also small formal play areas and larger playing pitches, including retained and enhanced hedgerows.
    - Attenuation features including swales, designed where possible with biodiversity in mind and with associated wet grassland (MG4 Alopecurus pratensis-Sanguisorba officinalis type)
    - Playing fields in the north and central areas linked to semi-natural habitats; allotments and a burial ground in the south of the Site and a solar farm, over species rich grassland, linked to both the Country Park and the northern buffer corridor with woodland planting along the boundary with existing off-site woodland here.

9.6.3 The GI will be accessible to the public, with clear paths providing walking and cycling routes to minimise the potential for the creation of unwanted desire lines and so avoid more sensitive habitats. The use of denser planting and natural obstacles will naturally limit access into selected habitats to promote their biodiversity, and prevent disturbance and degradation. Interpretation boards would highlight the habitats and wildlife that may be seen and encourage a sense of community ownership.

9.6.4 Habitat creation will be undertaken in accordance with landscape specifications and habitat creation prescriptions at the appropriate time of year, and follow recommended guidance to ensure its effective creation and initial establishment.

9.6.5 Identified effects will be also be avoided and reduced through appropriate site controls and working methods during construction and to a lesser degree once operational, including within the context of potential effects on individual animals which may arise as a result of their legal protection, if not identified as IEF.

9.6.6 The following section describes how the above has avoided or reduced the identified effects and provides the specific mitigation measures aimed at reducing the level of any adverse effects which are identified as potentially significant in the absence of mitigation. In addition, detailed measures are set out to ensure legal compliance, including for those species which have not been identified as IEF at the Site, but which nonetheless have legal protection.

9.6.7 It is anticipated that final details of mitigation and enhancement would be agreed with the local planning authority and be delivered through appropriately worded planning condition and/or S106 legal agreement or similar.

Mitigation of Construction Effects of Development

Designated Sites

9.6.8 To avoid, reduce and mitigate the identified effects on Bure Park LNR, through accidental pollution and contamination via the linked water-courses, all construction works would adhere to the most current best practice recommendations and guidance in respect of accidental pollution and contamination of the watercourses at the Site, including erosion and sediment control which may arise as a result of works and materials storage. An emergency response plan to deal with pollution incidents will be provided where necessary. These measures would avoid, and where necessary reduce and mitigate, all pollution and contamination effects on the Bure Park LNR.

9.6.9 This would be implemented as part of a comprehensive site wide/phased Construction Environmental Management Plan (CEMP) covering all works on site to ensure that current best working practices and recommended guidance in place at the time of works are adopted, including, but not limited to, measures to avoid contamination of the watercourse; seasonal/daily timings; precautionary working practices; barriers and signage. Roles and

responsibilities with respect to nature conservation would be outlined, including for an Ecological Clerk of Works.

9.6.10 It is anticipated that the need for and content of a CEMP would be secured by condition. Given the time required to the deliver the individual phases of the Development from the current supporting surveys, where necessary the CEMP would be informed by updated ecological surveys relevant to each phase of Development or species, applying the most recent ecological baseline to inform any changes to mitigation required at that time.

Habitat loss

9.6.11 Design has ensured that there will be minimal losses of IEF habitats from the outset. Necessary losses of IEF hedgerows and trees will be mitigated for in the long term by the creation of new species rich hedgerows and native trees within the GI throughout the built development and semi-natural areas, over and above that lost to ensure a net gain is provided.

Habitat disturbance

9.6.12 The implementation of the above CEMP will ensure that all retained habitats, including IEF habitats are afforded protection during construction works. Suitable fencing and buffers, including as set out within an approved Tree Protection Plan or similar, and in accordance with current guidance such as BS 5837 Guide to Trees and Hedgerows in Relation to Construction 2014 will avoid the potential for accidental ingress, physical damage and pollution. These measures would avoid, and where necessary reduce and mitigate, all identified construction effects on IEF habitats.

Bats

9.6.13 Retention of hedgerows and linear features, including around the Site boundaries within design ensures that alternative flight corridors remain reducing effects of fragmentation and isolation during construction. In addition the phased nature of works will ensure that not all features will be affected at any one time.

9.6.14 The avoidance of night working adjacent to bat habitats and corridors, or the use of directional flood-lighting away from potential habitats will avoid and reduce the potential for disturbance when bats are active (April – mid-October). Details of working methods and timing restrictions will be set out within the CEMP.

9.6.15 Prior to the removal of Trees T3, T5 and T6 as listed above, nocturnal assessment during the active bat season (May-August) will be undertaken to determine the presence or otherwise of an actual roost. These trees all have moderate roost potential and a total of two surveys per tree will be required. Should a roost be recorded during these a third survey would be required. Any tree found to be supporting bat roost/s will be removed under a NE European Protected Species Licence (EPSL), following an agreed method statement as set out within that and with relevant mitigation habitat provided to ensure provision of

alternative roosting habitat, likely in the form of the erection of bat boxes. Where a roost is not confirmed, trees will be removed in accordance with best practice methods, including soft felling, as detailed in the CEMP. Mitigation for the loss of any potential roost will be provided in the form of 3 bat boxes per tree removed, erected on nearby suitable trees.

9.6.16 Bats make transitory use of suitable tree roost sites and tree condition may change between this assessment and works occurring, so that new roosts may occur. Therefore in order ensure legal compliance, survey of any mature tree to be removed should be undertaken to assess the potential to support roosting at that time, and where necessary further surveyed to determine the presence/absence of bat roosts through aerial assessment where Health and Safety allows, or through nocturnal assessment to determine any new mitigation required.

Great crested newts

9.6.17 Impacts to great crested newts at P10 and to those in the wider area have been avoided and/or reduced through the incorporation of all aquatic habitat on site and the general retention of terrestrial habitats which they may be using (aside from necessary breaches for creation of roads) into the design of the GI, which will be linked to new habitat areas.

Mitigation will be required during construction to ensure that no GCN are harmed or injured as a result of these activities where they affect suitable habitat within 250m of ponds supporting GCN and potentially up to 500m from them. A NE derogation licence will be required to legitimise works and ensure suitable protection measures are in place. Whilst Oxfordshire is covered by the District Level Licencing DLL scheme, it considered likely that GCN mitigation at this Site will be in the form of a site level development EPSL from NE. This will entail a trapping and translocation exclusion exercise to be undertaken at the Site to ensure newts are removed from suitable habitat within the working areas prior to commencement, protective amphibian fencing around unaffected terrestrial and aquatic habitats and with on site habitat creation for GCN undertaken to ensure the FCS of the local populations is retained and enhanced *in situ* at the Site. It is recommended that an overall GCN Mitigation Strategy is provided by condition with phase specific strategies based on this provided as part of each reserved matters or full application. *Breeding and wintering birds*

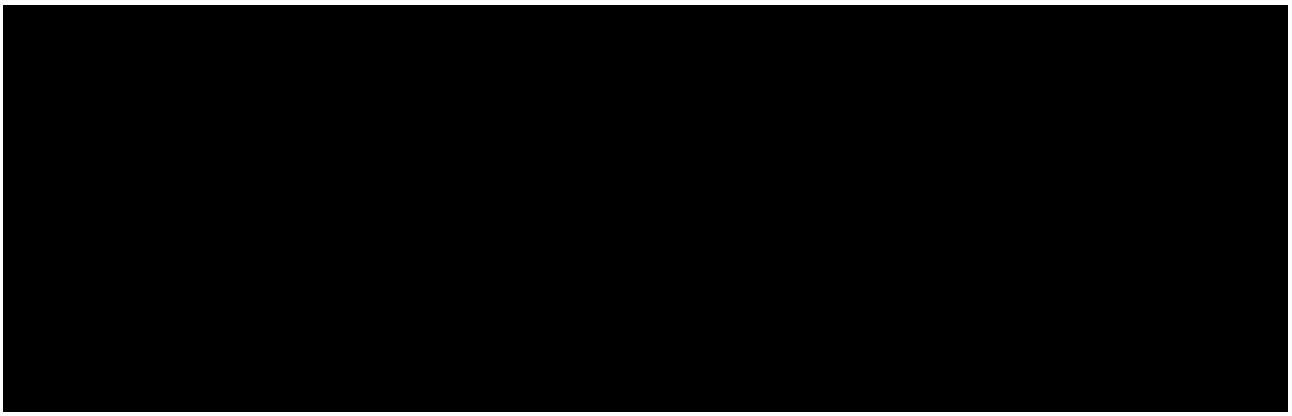
9.6.18 Loss of arable habitat for breeding lapwing is unlikely to be possible with the design given their specific habitat requirements and the off-site compensation that would be required on nearby suitable agricultural land (and managed to provide suitable breeding habitat for lapwing). This arable land would then be managed under Section 106 agreement in order to benefit breeding lapwing and encourage them to relocate locally. Where such land is not available financial contribution towards a suitable strategic farmland bird project in the local and wider area to secure the provision of suitable lapwing breeding habitat may be required. It is recommended that the requirement for a detailed lapwing mitigation strategy is the

subject of a suitably worded condition and/or S106 agreement, including trigger points to ensure implementation and delivery.

9.6.19 GI will include areas of undisturbed species-rich grassland using a suitable seed mix for foraging birds to mitigate the loss of arable land as alternative foraging opportunities for the notable farmland specialists skylark, yellow wagtail, linnet, yellowhammer, kestrel, grey partridge and meadow pipit, managed to favour these species through timing of cutting to and without the use of pesticides/fertilisers to ensure seed availability for foraging. In addition new scrub planting and hedgerows will provide suitable nesting habitat for grey partridge, linnet and yellowhammer reduce the effects of the loss of breeding habitat, in addition to creating further nesting habitat for the more generalist species recorded. The planting should comprise a diversity of native species, preferably fruit and nut-bearing species. Retained and newly planted hedgerows will include infrequently mown 2m grassy margins on either side, to provide nesting and foraging for farmland birds.

9.6.20 As all birds, their nests, eggs and fledgling young are protected whilst nesting, so mitigation will be implemented to ensure legal compliance and that no breeding birds are harmed during construction through the implementation of the CEMP. To avoid disturbance to nesting birds, site clearance works including the removal of woody vegetation/trees and arable areas will be conducted outside the bird breeding season, which runs March – August (inclusive). If clearance during the breeding season cannot be avoided, it will be preceded by a nesting bird survey conducted by an experienced ecologist. This will involve observing any vegetation to identify birds exhibiting nesting behaviour and / or searching for active nests. Should any active bird nests be identified then an exclusion zone would need to be retained until the chicks had fledged as determined by the supervising ecologist. Red kites breed in adjoining woodland to the north and specific mitigation may be required to ensure no breeding red kite are disturbed during works and should be included in the CEMP.

Other species



9.6.23 GI proposals in the area will provide sufficient new habitat to mitigate the loss of all foraging habitat at the Site and will include a mix of habitats which will provide permanent foraging, within grasslands, scrub and woodland and will allow for the natural creation of setts by badgers and maintain their movement corridors around and out of the site, including through the retention and enhancement of linear features.

9.6.24 Similarly, reptiles, whilst not an IEF, are legally protected from harm and may occur at the Site in small numbers. Mitigation is therefore required to ensure no individuals using suitable habitats affected by construction works are adversely affected through the precautionary working methods implemented via a CEMP. This includes works to linear features including ditches and hedgerows, tall ruderal and scrub areas. Mitigation should include timing restrictions and supervised clearance of key areas.

Mitigation of Operational Stages of Development

Designated Sites

9.6.25 The design of the Site includes 15ha of country park and other semi-natural habitat corridors easily accessible to the new community within the development, which will provide a variety of recreational opportunities and biodiverse habitats in close proximity to the housing, to meet the majority of every day recreational needs and will help reduce identified effects on the Bure Park LNR.

9.6.26 A full consideration of the potential for hydrological impacts post-development is considered in ES chapter 12. Mitigation to ensure that there are no adverse changes in the hydrological regime which could affect the Bure Park LNR habitats (and on site riparian and associated habitats) includes a sustainable drainage system that would ensure proposed discharge rates are set to mimic the equivalent greenfield rates and that a reduction in water quality of surface run-off is also unlikely due to the implementation of appropriate measures within the SUDS proposals.

Habitats

9.6.27 A conservation-led Biodiversity Management Plan or similar will be provided for the Development. The requirement for this will be delivered through a suitably worded condition

or other appropriate planning mechanism. The plan will provide the over-arching aims and objectives for on Site habitat creation and management aimed at benefiting biodiversity over the long-term, including details of management responsibilities and mechanisms to secure the long-term management and setting out the framework for ongoing management and monitoring. It will set out the targeted objectives and detailed management prescriptions for each habitat type or feature, the monitoring requirements and a five year work programme. These measures will seek to benefit local fauna which use or could use the Site. The plan would be a 'living document', with a programme of monitoring and feedback, to ensure that the on-going management is flexible and responds to change. Regular reviews and updates will be submitted and agreed with the LPA, and any other parties as agreed, and will be as set out within the approved Management Plan.

9.6.28 Responsibility, funding and management mechanism for the delivery of the on Site habitats would be determined as part of the planning process, via appropriate legal agreement between all relevant parties. This agreement will set out relevant party responsibilities for creation and management of the GI and open spaces, for the life of the development.

Bats

9.6.29 Best practice measures will be put in place to ensure that continuous movement along corridors is possible through the establishment of bat 'hop-overs' across breaches to linear features to maintain and enhance foraging and movement corridors, reducing effects of fragmentation and isolation. These will comprise heavy standard trees located on each side of the hedgerow gaps where a breach across a primary road occurs. Roads in the vicinity of hop-overs will be sensitively lit within safety parameters for vehicular traffic at any nearby junctions, and will be managed to raise bat flight lines above the height of traffic.

9.6.30 The provision of a sensitive lighting regime following industry best practice guidance and recommendations with regard to bats, will reduce adverse effects on foraging and roosting habits from increased lighting. Lighting design should minimise light-spill onto adjacent semi-natural habitats, including potential roosts and known/potential foraging or commuting habitat regularly used by the local bat population, notably within areas the three water course corridors. A combination of the following summarised mitigation measures would be undertaken, as outlined in Appendix 9.2:

- Avoiding unnecessary lighting;
- Timed lighting to light areas only when necessary;
- Low-level and / or hooded lamps to minimise light-spill, where possible;
- Low-intensity (sodium lamps or similar) lighting, where possible; and
- Strategic planting or landscaping to shield sensitive areas.

9.6.31 The design also provides mitigation and enhancement for the small scale loss of the foraging and commuting habitat with an increase in linear wood-edge habitat created around the site,

which will also provide both foraging and commuting habitat, linked to other habitats in the local area. GI will provide a valuable enhanced foraging resource for bats overall, with the associated complex of woodland, edge features, small ponds and grassland. In addition new attenuation facilities will provide potential new foraging habitat closely associated to movement corridors. A range of bat boxes will be provided for bats across the site to increase potential roosting habitat as the scheme matures, with new trees providing further potential roosting habitat upon maturation.

Great crested newts

9.6.32 Effects of increased disturbance on P10 will be reduced through use of fencing to minimise direct access by residents. Fencing will be set back from the pond edge and areas of new thorny scrub planting included between the fence and pond to further limit access. Routine management will ensure litter is discouraged and where appropriate removed.

9.6.33 Mitigation will be undertaken to minimise the potential for individual GCN being harmed by the road network where these breach GI corridors between suitable GCN habitats. Primary roads breaching the corridors extending west and north from P10 and at the southern end of the scrub north of Hawkwell Farm will include dropped kerbs and off-set gully pots to ensure GCN can move safely across these.

Birds

9.6.34 The nature and extent of habitats created will reduce effect arising from increased predation of birds by domestic pets, providing ample opportunity for shelter and protection across the Site. Appropriate waste management at the Site will reduce the potential for corvids being attracted, reducing effects of corvid predation.

9.6.35 Timing of habitat management works will ensure that there is year round supply of foraging resources available and would be described in the BMP or LEMP.

9.6.36 Overall inclusion of scrub, tree and hedgerow planting within the GI will provide significant areas of nesting habitat for the range of generalist non-IEF species recorded within the site. This planting, together with that proposed within the development area, should complement the retained hedgerows and woodland and comprise native species, preferably those that are fruit or nut bearing. Any attenuation or drainage features should seek to hold an area of permanent water, if at all feasible, to provide further wetland habitat for the assemblage of species recorded along the River Bure and the existing on-site watercourse corridors. Wetland grassland within the temporarily wet/inundated parts of the features, along with sensitive management, would provide valuable foraging habitat. The creation of new ponds specifically for wildlife would also be beneficial, planted with native marginal vegetation, including common reed *Phragmites australis.* If included this would provide good nesting opportunities for many species including some likely colonisers such as reed bunting *Emberiza schoeniclus* and sedge warbler *Acrocephalus schoenobaenus*.

9.6.37 A range of bird boxes aimed at providing enhancements for notable species that occur locally will provide additional nesting habitat whilst the scheme matures. A range of hole-nesting bird boxes will be erected across the site on suitable retained trees and hedgerows, with 32mm and 28mm hole sized boxes amongst those used.

9.6.38 Appropriate management of habitats within the GI will ensure that foraging habitat and breeding habitats are available, including over winter. Habitat management should include 2m wide grassy margins adjacent to retained and new native hedgerows to ensure suitable habitat is retained for the farmland species.

9.6.39 Any attenuation or drainage features should seek to hold an area of permanent water to provide further wetland habitat for the assemblage of species recorded along the River Bure and the existing on-site watercourse corridors. Wetland grassland within the temporarily wet/inundated parts of the features, along with sensitive management, would provide valuable foraging habitat. The creation of new ponds specifically for wildlife would also be beneficial, planted with native marginal vegetation, including common reed *Phragmites australis.* If included this would provide good nesting opportunities for many species including some likely colonisers such as reed bunting *Emberiza schoeniclus* and sedge warbler *Acrocephalus schoenobaenus*.

9.6.40 A range of bird boxes aimed at providing enhancements for notable species that occur locally will provide additional nesting habitat whilst the scheme matures. A range of hole-nesting bird boxes will be erected across the site on suitable retained trees and hedgerows, with 32mm and 28mm hole sized boxes used.

Other species

[redacted]

9.7 Residual Effects

9.7.1 Residual effects for IEF are identified and described below.

Construction Effects

9.7.2 With the implementation of a comprehensive CEMP and best working practices, all effects on the Bure Park LNR and all retained habitats on Site are considered to be negligible.

9.7.3 In the **short term there will be minor residual effects at a below local level** in respect of hedgerow loss. In the longer term, as new hedgerows and wood-edge planting mature

residual effects will be reduced to negligible, with minor positive effects anticipated once the GI matures.

9.7.4 There will be **minor residual effects at a site level** in the short term on foraging and commuting bats arising from hedgerow breaches for construction of the primary road system in the short term, while bat 'hop-overs' mature and re-establish connectivity along retained routes and whilst bats habituate to new routes. This will be minimised by the early creation of hop-overs in the scheme. In the medium-long term, residual impacts will be negligible.

[redacted]

9.7.6 Implementation of the CEMP will further ensure that all effects on all IEF fauna and protected species as a result of construction activities are negligible through use of best practice, adherence to recommended guidance and precautionary and supervised working methods and timings.

9.7.7 Loss of potential ground nesting vegetation which cannot be replaced within the Scheme will lead to residual impacts for lapwing, skylark, yellow wagtail, grey partridge, yellowhammer, linnet, kestrel and meadow pipit in the short term, increasing as phased removal occurs. The implementation of lapwing mitigation strategy through either provision of off-site land or financial contributions secured by S106 will ensure that residual effects are negligible. Following creation of grassland and verges associated with hedgerows within the GI adverse effects to the other species excluding lapwing will be of **minor significance at local level**.

9.7.8 Short term impacts for other breeding birds through loss of nesting and foraging habitat in the form of woody habitats are considered to be negligible as other similar habitat will be retained. Upon maturation significant new habitat will be available to these species and **positive minor effects at a local level**, may be expected.

9.7.9 Residual effects of the loss of wintering habitat on skylark, grey partridge, stock dove, yellowhammer, linnet, kestrel and meadow pipit will be of **minor significance at a below local level**. Residual impacts on grey wagtail are considered to be negligible through their ability to use urban habitats and wetland habitats.

Operational Stages of Development

9.7.10 With the provision of the GI at the Site residual effects on the Bure Park LNR as a result of increased recreation are considered to be negligible.

9.7.11 With the implementation of the SuDS residual effects on the Bure Park LNR and habitats on Site will be negligible.

9.7.12 The implementation of a sensitive lighting regime, creation of hop-overs and extent and range of GI habitats, including additional roosting habitat of value to bats means that all residual effects on all bat species using the Site will be negligible, increasing to **minor beneficial in the long term, potentially at a local level**.

9.7.13 The use of dropped kerbs and off-set gully pots, creation of enhanced habitat corridors, and GI of suitability for great crested newts will mean that all residual effects on GCN will be negligible, with the potential for **minor beneficial effects at an at least below local level** in the long term.

9.7.14 Provision of a range of habitats providing secluded/sheltered opportunities and implementation of a waste management practices will ensure residual effects of predation on birds are negligible.

9.8 Cumulative Effects

9.8.1 The list of schemes considered as part of the cumulative effects within the ES chapter are listed in section 1.

9.8.2 It is anticipated that for all proposed developments to be considered as part of this cumulative assessment, primary and secondary mitigation measures would be in place to reduce any adverse effects on nature conservation and biodiversity arising from these developments to acceptable levels, including through appropriate design, with mitigation and compensatory measures where necessary leading to biodiversity enhancements. On the assumption that each approved or anticipated forthcoming development therefore incorporates appropriate mitigation to reduce its own effects, overall effects will be no greater than any individual effect identified for this Proposed Development and would be unlikely to result in any long-term significant harm for the vast majority of receptors.

9.8.3 For most of the IEF, residual effects are considered to be negligible following the implementation of mitigation and/or compensation as described. The following highlights IEF for this Site which have been identified as having residual effects and for which cumulative effects may therefore be anticipated.

9.8.4 In the short term the scheme will lead to loss of hedgerow of minor significance at a below local level until new hedgerows mature, therefore for any of the identified developments occurring within a similar time-frame to this, there could be minor adverse effects of hedgerow loss within the wide hedgerow network at a local level when considered cumulatively. These losses could also lead to a minor adverse effect on foraging and commuting bats in the short term only, higher than that identified for the Site itself (Site level), at a below local, or potentially local level, dependent on the time-frames of other developments coming forward.

9.8.5 Loss of farmland at the Site would lead to minor adverse impacts on a number of breeding and wintering birds at a local level which cannot be mitigated within the Scheme or through off-site compensation as described. All sites identified are/were located on apparently similar farmland habitats of a scale that has the potential to result in a **permanent, up to moderate adverse effect on the local population** in the longer term once all farmland

habitat has been lost, which cannot easily be mitigated for within scheme designs, when considered cumulatively with the Site for the following species:

- Skylark (breeding and wintering)
- Yellow wagtail (breeding and wintering)
- Grey partridge (breeding and wintering)
- Yellowhammer (breeding and wintering)
- Kestrel (breeding and wintering)
- Linnet (breeding and wintering)
- Stock dove (wintering only)
- Grey wagtail (breeding only)

9.9 Summary

9.9.1 This chapter has assessed the likely significant effects of the proposals on the ecology and nature conservation at the Site, based on an assessment of desk study and field data against the parameters of the Proposals. The methodology and approach to assessment have been described; baseline conditions for the site and surrounding area set out and effects characterised and assessed for both the site prior to any mitigation. Embedded mitigation to avoid and reduce potential effects from the outset through avoidance and design measures undertaken at the outset has been described, with any further mitigation, compensation and enhancement measures to address identified effects presented, with subsequent residual and cumulative effects with other projects in the local area identified. Measures required to ensure legal compliance for any protected species have also been presented.

9.9.2 The Site supports no designation for nature conservation. The closest designation Bure Park LNR which lies within 50m of Site to its west, connected by the River Bure, culverted below the separating main road and has the potential to be indirectly affected by construction works and by increased recreational pressure. Mitigation will be put in place to avoid and reduce construction effects, including through the implementation of appropriate protective and precautionary measures and working practices as described within a supporting CEMP, and through the provision of the Site's GI, such that none are considered significant, including when considered cumulatively. All other designated sites are considered to be sufficiently distant that significant effects would not be expected during or post construction.

9.9.3 The site is dominated by intensively managed farmland, and of consequent limited overall ecological value. Hedgerows and water courses provide habitat corridors through this, which extend into the wider area. Hedgerows support mature and semi-mature trees and are a mix of higher and lower value features and a small number are considered to be species rich, with three considered to be of Importance under the Hedgerow Regulations 1991. They have limited associated ground flora. Watercourses are not of particular botanical interest.

These features all provide a foraging and commuting network for local fauna, including bats and great crested newts. The vast majority of these are to be retained and incorporated into the GI, with only small scale losses/disturbance to accommodate access infrastructure mitigated by the GI and assessed as not significant. Other habitats of greater interest, although still not particularly botanically diverse include a small area of broadleaved woodland, dense scrub south of Bucknell Road and a small pond, as well as compartment of species poor rough grassland in the north of the Site. These are all to be incorporated into the GI. The CEMP will ensue all retained habitats are protected during construction.

9.9.4 The Site supports a number of protected species, including bats, great crested newts, and badger as well as a range of notable bird species. The implementation of a CEMP during construction will ensure all effects are negligible for these species.

9.9.5 A small range of largely common and widespread bat species is dominated by common and soprano pipistrelle, typical of the habitats present. Activity levels were generally low and typically focussed along the water course features. Predominantly small numbers of three less common bats were recorded, including two listed as Annex II species. Numbers recorded were not considered significant. Several trees provide suitable roosting features, four of which with low/moderate potential will be removed. Commuting features will largely be retained and mitigation put in place to enable continued movement along breached features. New more diverse habitats and linear features will be created to enhance foraging and movement opportunities throughout the GI and a sensitive lighting regime put in place. Adverse effects on bats are not significant and positive effects are expected once GI establishes.

9.9.6 A small-medium population of great crested newt was recorded in the single pond on Site. Much of the Site is of limited suitability as terrestrial habitats, although the pond is linked to an area of scrub and woodland by hedgerows which are likely to be used. This pond is not connected to other significant habitat areas or ponds supporting great crested newts within the surrounding 500m, although populations of this species are present beyond this. Much of the suitable habitat will be retained and mitigation put in place to ensure their favourable conservation status is retained and potentially enhanced, during and post construction, through appropriate licenced works during construction and the retention and creation of the GI of value to newts.

9.9.7 Positive effects on generalist bird species are anticipated as result of the retention of the proposals with the retention of the majority of their foraging and breeding habitat and the creation of the GI. For six of the farmland specialists recorded, adverse effects at a local level could be expected which cannot be mitigated by the habitats within the GI, but are not considered to be significant alone, although are more significant up to a moderate level when considered cumulatively with farmland habitat losses associated with other developments. Off-site mitigation is required to reduce effects on lapwing.

9.9.8 Other protected species require mitigation during works due to the legal status, but the site is generally not considered to be of particular value to them – badgers and reptiles. The GI will enhance habitats for these.

9.9.9 Overall, the scheme brings the opportunity for significant biodiversity benefits and deliver a measurable net gain at the Site and for the local area, enabling a sensitively managed coherent habitat mosaic to be created, linked to off-site semi-natural habitats and contributing to biodiversity targets for a range of locally important habitats and species.

9.9.10 A summary of the assessment is set out in Table 9.18.

Table 9.18: Assessment of Significance of Residual Effects

IEF	Possible Effect	Duration	Significance Major/Moderate/ Minor/Negligible Beneficial/Adverse	International/ National/ Regional/ Local	Mitigation	Residual Effect
	Construction					
Bure Park LNR	Habitat degradation; Accidental pollution via hydrological connections	Temporary; Periodic multiple events	Minor Adverse	Local	CEMP	Negligible
17 Hedgerows	Loss or breaching for access roads	Permanent; Several single events	Minor Adverse	Below Local	Overall retention of majority of features by design; Habitat creation	Negligible (minor adverse in short term)
2 watercourses (D1 / D3) / all retained IEF habitats	Habitat disturbance & degradation and accidental pollution	Temporary; periodic	Minor adverse	Local	CEMP	Negligible

IEF	Possible Effect	Duration	Significance Major/Moderate/ Minor/Negligible Beneficial/Adverse	International/ National/ Regional/ Local	Mitigation	Residual Effect
Bats	Fragmentation of movement / foraging corridors; isolation from habitats	Permanent; several events	Minor adverse	Local	Retention of some features without breaches by design; Creation of hop-overs and alternative flight lines	Minor Positive (minor adverse in short term)
	Disruption to foraging and roosting patterns through lighting	Temporary; periodic	Minor adverse	Below local	CEMP	Negligible
	Loss of potential tree roosts	Permanent; single event	Minor adverse	Below local	2 x nocturnal survey May-August on each tree prior to removal. Erection of 3 bat boxes per tree lost. CEMP or implementation of licensing prior to works as relevant	Negligible

IEF	Possible Effect	Duration	Significance Major/Moderate/ Minor/Negligible Beneficial/Adverse	International/ National/ Regional/ Local	Mitigation	Residual Effect
Great crested newts	Fragmentation and isolation from foraging habitat through hedgerow breaches	Permanent; several events	Minor adverse	Below local	Implementation of licencing prior to works	Negligible
	Harm and mortality	Permanent; multiple events	Minor adverse	Below local	Implementation of licencing prior to works	Negligible
Breeding Lapwing	Habitat loss; Harm; mortality;	Permanent; multiple events	Minor adverse	County	Off-site compensation / financial contribution CEMP	Negligible
Breeding Skylark	Habitat loss Harm; mortality;	Permanent; multiple events	Minor-moderate adverse	Local	Some suitable grassland habitat within GI CEMP	Minor adverse
Breeding grey partridge; yellow wagtail yellowhammer;	Habitat loss; Harm; mortality;	Permanent; multiple events	Minor adverse	Local	Some suitable habitat within GI CEMP	Minor adverse

IEF	Possible Effect	Duration	Significance Major/Moderate/ Minor/Negligible Beneficial/Adverse	International/ National/ Regional/ Local	Mitigation	Residual Effect
linnet; kestrel; meadow pipit						
All breeding IEF species	Disturbance	Temporary; multiple events	Minor adverse	Below Local	Phased nature CEMP	Negligible
Wintering skylark, grey partridge, stock dove, yellowhammer, linnet, kestrel and meadow pipit	Habitat loss	Permanent; multiple events	Minor adverse	Below Local (poosibly local for grey wagtail)	Phased nature CEMP Creation of new habitats for all species within GI	Negligible
	Operational Development					
Bure Park LNR / retained IEF habitats	Habitat degradation through increased recreational use	Permanent	Mino adverse	Below local	Creation of accessible semi-natural habitats and walk in GI	Negligible
	Habitat degradation	Permanent	Minor Adverse	Local	SuDS	Negligible

IEF	Possible Effect	Duration	Significance Major/Moderate/ Minor/Negligible Beneficial/Adverse	International/ National/ Regional/ Local	Mitigation	Residual Effect
	through changed hydrological regime					
Bats	Altered lighting regimes affecting roosting and foraging behaviour; Increased mortality at road crossings	Permanent	Minor adverse	Below local	Sensitive lighting regime Dark corridors in GI Hop-overs Alternative flight lines created New foraging and roosting habitats including bat boxes	Negligible Minor positive
Great crested newts	Increased mortality at road crossings within 250m of ponds	Permanent	Minor adverse	Below local	Licencing / Dropped kerbs and off-set gullies	Negligible
	Increased disturbance to	Permanent	Moderate adverse	Below local	Protective planting and fencing	Negligible

IEF	Possible Effect	Duration	Significance Major/Moderate/ Minor/Negligible Beneficial/Adverse	International/ National/ Regional/ Local	Mitigation	Residual Effect
	retained aquatic habitats					
IEF birds	Increased mortality and disturbance from domestic pets and corvids	Permanent	Minor adverse	Below local	New planting and habitats providing shelter; nest boxes Waste management strategy	Negligible (Minor positive)