OXFORDSHIRE
STRATEGIC RAIL FREIGHT INTERCHANGE

Environmental Statement

Chapter 6: Ecology including Arboriculture

Document 6.6
Revision A

On behalf of
Oxfordshire Railfreight Limited

Prepared by FPCR
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6.1 INTRODUCTION

6.1.1 This chapter assesses the potential effects of the Proposed Development on Ecology and Arboriculture. It reviews the existing baseline ecology of the Application Site, the potential direct, indirect and cumulative impacts during the construction and operational phases of the Proposed Development, and outlines working methods and appropriate mitigation and compensation measures. Biodiversity enhancements are proposed and described, and residual effects following mitigation and compensation identified.

6.1.2 This chapter is supported by Technical Appendices and their associated figures which provide the detailed survey methodologies, results and subsequent assessments of ecological surveys undertaken to inform this assessment. These are as listed below:

- Technical Appendix ES6.1: Ecological Appraisal Report;
- Technical Appendix ES6.2: Ardley Cutting & Quarry SSSI Botanical Survey Report;
- Technical Appendix ES6.3: Bat Report;
- Technical Appendix ES6.4: Great Crested Newt Report;
- Technical Appendix ES6.5: Bird Report;
- Technical Appendix ES6.6: Badger Report;
- Technical Appendix ES6.7: Butterfly Survey Report;
- Technical Appendix ES6.8: Arboricultural Assessment;
- Technical Appendix ES6.9: Biodiversity Net Gain Assessment
- Technical Appendix ES6.10: Shadow Habitats Regulation Assessment
- Technical Appendix ES6.11: Habitat Management and Monitoring Plan

6.1.3 A detailed description of the Application Site and Proposed Development is provided in Chapter 2 *Description of Development and Alternatives* of this Environmental Statement.

6.1.4 All the land involved in delivering the Proposed Development - comprising the Main Site and Highway Works areas, including the J10 Highway Improvement Works, Ardley Bypass, Middleton Stoney Relief Road and Heyford Park Link Road - is referred to as the ‘Application Site’. A summary term for the proposals as a whole is the ‘Proposed Development’. Full description of the Proposed Development is provided in Chapter 2.

Glossary of Terms

6.1.5 A Glossary of Terms describing the physical components of the OxSRFI Proposed Development are set out in Table 1.2 of Chapter 1. A Glossary of Terms specific to this chapter are set out in Table 6.1 below.

Table 6.1: Glossary of Terms for Ecological Components of the OxSRFI Proposed Development

Abbreviation	Definition
ACIEEM	Associate Member of the Chartered Institute of Ecology and Environmental Management
ASNW	Ancient Semi-natural Woodland
BAP	Biodiversity Action Plan
BBOWT	Berks, Bucks & Oxon Wildlife Trust
BoCC	Birds of Conservation Concern
BMCL	Bat Mitigation Class License
BNG	Biodiversity Net gain
BSBI	Botanical Society of Britain and Ireland
CEMP	Construction and Environmental Management Plan
CIEEM	Chartered Institute of Ecology and Environmental Management
CTA	Conservation Target Area
DAS	Discretionary Advice Service (Natural England)
DWS	Cherwell District Wildlife Site
pDWS	Proposed Cherwell District Wildlife Site
EcoW	Ecological Clerk of Works
eDNA	Environemtnal DNA (Deoxyribonucleic acid)
EIA	Environmental Impact Assessment
EPSL	European Protected Species Licence
ES	Environmental Statement
FISC	Field Identification Skills Certificate
GCN	Great Crested Newt
GI	Green Infrastructure
GPP	Guidance for Pollution Prevention
HEGS	Hedgerow Evaluation and Grading System
HMMP	Habitat Management and Monitoring Plan
HPI	Habitat of Principal Importance
HR	The Conservation of Habitat and Species Regulations (2017)
HSI	Habitat Suitability Index
IEF	Important Ecological Features
IEMA	Institute of Environmental Management and Assessment

Abbreviation	Definition
IRZ	Impact Risk Zone
LBAP	Local Biodiversity Action Plan
LNRS	Local Nature Recovery Strategy
LONI	Letter of No Impediment
LPA	Local Planning Authority
LWS	Local Wildlife Site
pLWS	Potential Local Wildlife Site
PRF	Potential Roost Feature
MAGIC	Multi-Agency Geographic Information for the Countryside
MCIEEM	Full Member of the Chartered Institute of Ecology and Environmental Management
NERC	The Natural Environment and Rural Communities
NNR	National Nature Reserve
NPPF	National Planning Policy Framework
NNPS	National Policy Statement for National Networks
NPPG	National Planning Practice Guidance
OCC	Oxfordshire County Council
PAWS	Plantation on Ancient Woodland Site
P-CEMP	Phase specific Construction and Environmental Management Plan
POS	Public Open Space
S41	Section 41
SAC	Special Area of Conservation
S.41	Section 41 of the NERC Act (2006)
sHRA	Shadow Habitat Regulations Assessment
SPA	Special Protection Area
SPI	Species of Principal Importance
SSSI	Site of Special Scientific Interest
SuDS	Sustainable Drainage System
TN	Target Note
TVERC	Thames Environmental Records Centre
UK BAP	United Kingdom Biodiversity Action Plan
WCA	The Wildlife and Countryside Act (1981) (as amended)
WFDA	Water Framework Directive Assessment

Competency Statement

6.1.6 This Chapter and associated surveys have been prepared by FPCR Environment and Design Ltd. FPCR are a multi-disciplinary environmental and design consultancy with over 60 years' experience of architecture,

landscape, ecology, urban design, masterplanning and environmental impact assessment. The practice is a member of the Institute of Environmental Management and Assessment (IEMA) and is frequently called upon to provide expert evidence at Public and Local Plan Inquiries. FPCR have extensive experience and expertise of the EIA process.

6.1.7 The ecological surveys, assessment and preparation of this chapter have been carried out by suitably experienced ecologists and Members of the CIEEM in accordance with the guidance of the professional institution[1]. Rachel Gordon MCIEEM is the principal authors of this chapter, working with Hayley Hurst ACIEEM. Rachel Gordon has over 17 years of experience in the environmental and EIA sector, including authoring ES chapters for large-scale residential, infrastructure and logistics/commercial projects. Hayley Hurst has over eight years' experience in the environmental consultancy sector. Her experience covers a range of schemes, including large-scale residential and employment projects. This has involved authoring and contributing to ES Chapters. Nick Law is a contributing author and reviewer of this chapter. He has over ten years of experience in the environmental and EIA sector and is a highly experienced botanist and has authored ES chapters for a wide range of projects. The Biodiversity Net Gain (BNG) assessment was led by James Hutchison MCIEEM CEcol. James is an experienced botanist and BNG assessor with over 10 years' experience in the environmental consultancy sector.

6.1.8 The arboricultural surveys have been carried out by suitably experienced arboriculturists with LANTRA Professional Tree Inspector status and membership of the Arboricultural Association. Edward Cole is the principal author of the Arboricultural Assessment. Edward has over 12 years' experience as an arboricultural consultant producing Arboricultural Assessments for large-scale residential, infrastructure and logistics/ commercial projects.

[1] Chartered Institute of Ecology and Environmental Management (CIEEM) 2018. *Guidelines for Ecological Impact Assessment in the UK and Ireland, Terrestrial, Freshwater Coastal and Marine*. v.1.3, updated September 2024.

6.2 ASSESSMENT SCOPE AND METHODOLOGY

Identification of Important Ecological Features (IEFs)

6.2.1. The CIEEM Guidelines require identification of IEFs that could be significantly affected, either positively or negatively by a proposed development.

6.2.2. 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.

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

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

Desktop Study

6.2.5. A desktop survey was undertaken in July 2018 and was updated in June 2021 and again in March 2025 in order to obtain relevant background information to inform the assessment including protected and notable species records and details of sites designated for their nature conservation interest.

6.2.6. The geographical extent of the search area for biodiversity information was related to the significance of sites and species, and potential Zones of Influence (ZoI) which might arise from the Proposed Development. The following scales of search beyond the Application Site were considered appropriate:

- 15km for sites of International Importance that are Ramsar sites;

- 15km for sites of international importance that form part of the National Site Network[2] (i.e. Special Areas of Conservation (SAC) and Special Protection Areas (SPA));
- 2km around the Application Site for statutory sites of National Importance (e.g. Sites of Special Scientific Interest (SSSI), National Nature Reserves (NNR));
- 1km around the Application Site for non-statutory designated sites of County Importance (e.g. Sites of Importance for Nature Conservation (SINC) / Local Wildlife Sites (LWS); and
- 1km for protected or otherwise notable species records, including Species of Principal Importance for the conservation of biodiversity as listed within S41 of the NERC Act (2006) (2km for bats), from within the preceding 20 years.

6.2.7. The following organisations / databases were contacted or used to inform the desk study and identify any features of potential importance for nature conservation in the wider countryside:

- Multi Agency Geographic Information for the Countryside (MAGIC) website[3];
- Thames Valley Environmental Records Centre (TVERC);
- NBN Atlas[4]
- Colour 1:25,000 OS base maps; and
- Aerial photographs from Google Earth.

6.2.8. Natural England's SSSI Impact Risk Zone (IRZ) Tool was used (via the MAGIC website) to determine whether the type and scale of the Proposed Development was considered by Natural England to have the potential to affect statutory designated sites of international and national importance.

6.2.9. The location of relevant biological data and nature conservation records identified via the desktop survey are summarised in Figures 1 and 2 of Appendix ES6.1.

[2] Following the UK withdrawal from the EU SACs and SPAs in the UK no longer form part of the EU's Natura 2000 ecological network. They now form the UK National Site Network (NSN) created by the Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019 which amended the Conservation of Habitats and Species Regulations 2017. However, in terms of hierarchical importance for nature conservation, the sites forming the NSN are considered to retain their international importance.
[3] https://magic.defra.gov.uk/MagicMap.aspx
[4] https://nbnatlas.org

Field Survey

6.2.10. The following paragraphs outline the surveys carried out to provide an appropriate evidence base to inform the assessment. As set out below, there is an extensive body of evidence that supports the description of the baseline characteristics of the Application Site.

Flora

6.2.11. Surveys of the Main Site were undertaken in February 2018, June 2020, and May 2021. Additional areas associated with the Highways Works areas were undertaken during June and August 2021, August 2022, and further update surveys of the Main Site and Highways Works Areas were undertaken in June 2025. The update surveys additionally incorporated land located to the north-west and south-east of the Main Site and to the northeast of the Middleton Stoney Relief Road assigned to the delivery of biodiversity mitigation and enhancement.

6.2.12. Surveys were undertaken by experienced botanists from FPCR holding a level 3 or above Field Identification Skills Certificate (FISC) competency, as issued by the Botanical Society of Britain and Ireland (BSBI). Field methods broadly followed UKHab classification system[5] and involved a walked survey to classify the broad habitat types present using the system published by the UK Joint Nature Conservation Committee[6], and identify any Habitats of Principal Importance for the conservation of biodiversity as listed within Section 41 (S.41) of the NERC Act 2006. The current condition of each habitat was also noted.

6.2.13. Hedgerows were assessed against the Wildlife and Landscape criteria of the Hedgerow Regulations 1997 (Statutory Instrument No: 1160)[7] to determine whether they qualified as 'Important Hedgerows' under the Regulations, and against the criteria for identification as Hedgerow Habitat of Principal Importance (HPI) under Section 41 of the NERC Act 2006 or Priority Habitat identified within the Oxfordshire Local Biodiversity Action Plan (LBAP).

[5] Butcher, B., Carey, P., Edmonds, R., Norton, L. and Treweek, J. 2020. *The UK Habitat Classification User Manual 1.1* http://www.ukhab.org [Accessed 22/04/2025].
[6] JNCC, 2010. Handbook for Phase 1 Habitat Survey – a Technique for Environmental Audit. Joint Nature Conservation Committee, Peterborough.
[7] The Hedgerow Regulations 1997 – Statutory Instrument 1997 No. 1160. [Online]. London: HMSO. Available at: http://www.legislation.gov.uk/uksi/1997/1160/contents/made [Accessed 22/04/2025].

6.2.14. Survey of Ardley Cutting and Quarry SSSI was undertaken by experienced ecologists, initially in August 2020 and June 2022 (FISC level 6) and updated in June 2025 (FISC level 5). Full details are provided in **Appendix ES6.2.**

Fauna

6.2.15. Further detailed specific-species surveys have been updated and completed over the Application Site during appropriate survey period in 2024-2026 including:

- Badger *Meles meles* surveys,
- Bat surveys of the buildings and trees including aerial inspection of mature trees identified as potential roost sites,
- Appropriate nocturnal surveys of mature trees and buildings (where necessary),
- Monthly bat night-time walkover (transect and flightline) surveys and static (passive) detector surveys,
- Aquatic great crested newt (GCN) *Triturus cristatus* surveys and eDNA surveys,
- Winter bird surveys,
- Breeding bird surveys,
- Reptile surveys,
- Otter *Lutra lutra* survey,
- Water vole *Arvicola amphibius* survey, and
- Butterfly surveys.

6.2.16. Full methodologies for the completion of the above-mentioned surveys are detailed in **Appendices 6.1 - 6.10**.

Trees

6.2.17. The arboricultural assessment was completed during June 2021 and was updated in April 2025 by an experienced arboriculturist with LANTRA Professional Tree Inspector status. The assessment was undertaken in accordance with guidance contained within British Standard 5837:2012 'Trees in Relation to Design, Demolition and Construction -

Recommendations'[8]. The guidelines set out a structured assessment methodology to determine existing trees' arboricultural value, based on their current condition and quality.

Evaluation and Assessment

6.2.18. The evaluation and assessment of nature conservation features of interest and potential impacts on them is based on guidelines defined within the CIEEM Guidelines. In determining the importance of ecological features, various factors were considered, including but not limited to statutory and non-statutory designation status, legal protection, habitat connectivity and/or synergistic associations, size of habitat or population, habitat condition and local rarity. The importance of ecological features was defined in a geographical context.

6.2.19. The CIEEM Guidelines (page 15) define impact as "*Actions resulting in changes to an ecological feature*" and effect as the "*Outcome to an ecological feature from an impact*".

6.2.20. Impacts and effects have been assessed in terms of their magnitude, extent, duration, reversibility, timing and frequency, confidence in predictions and whether they are positive or negative.

6.2.21. Sensitivity of the ecological receptor and magnitude of effect are considered to determine the level of significance of the effect, whether it be beneficial or adverse to the integrity of the ecological receptor. A description of the parameters that are considered when assessing the degree and type of change is detailed in Table 6.2.

Table 6.2: Parameters Used to Describe Effects

Parameter For Describing Impacts on Ecological Structure and Function	Definition of the Parameter
Beneficial or Adverse	Whether the change resulting from an impact or effect improves or reduces the quality of the environment.
Extent	The area over which the impact or effect occurs.
Magnitude	The size, amount, intensity or volume of an impact or effect.
Duration	The time for which the effect is predicted to last prior to recovery or replacement of the resource or feature.

[8] British Standards (BSI) 2012. BS 5837:2012 Trees in relation to design, demolition and construction – Recommendations. British Standards Publication

Parameter For Describing Impacts on Ecological Structure and Function	Definition of the Parameter
Frequency and Timing	How often the effect occurs (e.g. repeated noise from piling work) and when it occurs (e.g. vegetation clearance undertaken outside of the bird breeding season).
Reversibility	Whether the effect is permanent (i.e. irreversible) or temporary (i.e. reversible)

6.2.22. In accordance with the current CIEEM EcIA Guidelines[9], the assessment of the significance of effects on ecological receptors differs to the assessment methodology used within other ES Chapters in that the use of a matrix approach based on defined categories of impact magnitude and receptor sensitivity is avoided. Professional judgement is instead employed to identify the significance of effects on IEFs based on an assessment of the available data and an understanding of how each IEF is likely to be affected by the Proposed Development, with consideration given to the parameters outlined in Table 6.2.

6.2.23. For the purposed of ecological assessment, a 'significant effect' is defined as an effect that either supports or undermines biodiversity conservation objectives for an IEF or for biodiversity in general. Conservation objectives may be specific (for example on the structure and function of a designated site or the extent, abundance or distribution of individual species) or broad, for instance national/local nature conservation policy, or wide-ranging, such as the enhancement of biodiversity. In the context of the EIA Regulations any effects with a significance level of minor or less are not considered significant (Table 6.3).

6.2.24. Significant effects are then qualified with reference to the importance of the IEF at an appropriate geographic scale from international to local. A significant effect on a SSSI for example is likely to be of national significance, however, the scale of significance of an effect will not necessarily be the same as the geographic context in which the feature is considered important[10]. An effect on a species included on a national list of species of principal importance for biodiversity for example, may not experience a significant effect on its national population, though nevertheless may be considered significant at a more local scale.

[9] Chartered Institute of Ecology and Environmental Management (CIEEM) 2018. Guidelines for Ecological Impact Assessment in the UK and Ireland, Terrestrial, Freshwater Coastal and Marine. Version 1.3, updated September 2024.
[10] Chartered Institute of Ecology and Environmental Management (CIEEM) 2018. Guidelines for Ecological Impact Assessment in the UK and Ireland, Terrestrial, Freshwater Coastal and Marine. Version 1.3, updated September 2024.

Table 6.3: Classification of the Significance of and Effect

Significance Level	Definition
Significant Adverse Effect	Likely to result in a significant negative effect, including loss or damage to the structure, function, or conservation status of the ecological feature.
Not Significant Adverse Effect	An impact of limited duration and/or minor extent and influence such that it does not cause extensive, long-term or irreversible damage to the IEF. Unlikely to affect conservation status.
Not Significant Neutral	Effects are either absent or such that there is no overall net change to the ecological feature.
Not Significant Beneficial Effect	Likely to result in a beneficial effect on the structure, function, or conservation status of the ecological receptor without causing significant permanent enhancement.
Significant Beneficial Effect	Likely to result in extensive/substantial enhancement of the structure, function, or conservation status of the IEF.

6.2.25. Mitigation or compensation is provided for impacts likely to result in a significant adverse effect on features of nature conservation importance. In line with the 2018 CIEEM guidelines the mitigation for the Proposed Development should aim to:

- Avoid significant adverse ecological impacts;
- Reduce adverse impacts that cannot be avoided, and
- Compensate for any residual significant ecological impacts.

6.2.26. Priority is given to the avoidance of adverse effects, where possible, through primary or ‘embedded’ mitigation measures, i.e. masterplanning and project design and/or regulation of the project through deploying good practice on aspects such as timing of construction works and the storage of materials on-site, etc. The main ‘embedded’ and design measures of relevance are set out in Section 6.5 of this Chapter (paragraphs 6.5.14 to 6.5.18), and at a high-level in Chapter 2. In addition, once potential effects have been identified, consideration is given to the need or opportunity to further reduce likely residual adverse effects through additional mitigation measures (also see Chapter 2). If significant effects cannot be avoided through mitigation, then appropriate compensation is considered to offset the adverse effects of the project.

Consultation

6.2.27. Comments relevant to the ecology and nature conservation of the Application Site were received from the Planning Inspectorate as part of the Scoping Opinion process for the Proposed Development[11].

6.2.28. Subsequent to this, and following redesign of the Proposed Development, comments were received from the Planning Inspectorate specifically regarding the Shadow Habitats Regulations Assessment (sHRA) report[12]

6.2.29. Queries or concerns relating to the ecology of the Application Site raised as part of that process are addressed within this Chapter. A summary of the original comments and the corresponding summary responses is provided in Table 6.4.

Table 6.4 – Summary of EIA Scoping comments, and responses

Planning Inspectorate Comment Summary	Response
Scoping Opinion	
Reptiles: **ID 4.4.1** The ES should be supported by a sufficient level of survey effort for reptiles.	Reptile surveys were undertaken across suitable habitats throughout the Main Site and Highway Works areas during 2021, with a full suite of updating surveys completed in 2025. The results of these surveys are considered within the relevant sections of this chapter, and full survey data is reported within the supporting Ecological Appraisal Report (Appendix ES6.1).
Aquatic Ecology: ID 4.4.2 The ES should include an assessment of effects on aquatic ecological receptors where significant effects are likely to occur.	Potential effects on the flora and fauna communities associated with the watercourses are considered within the relevant sections of this chapter and within the Water Framework Directive Assessment (Appendix ES9.5). Field data from the Application Site is reported within the supporting Ecological Appraisal Report (Appendix ES6.1).
Study Area: ID 4.4.3 The ES should justify any study areas used for the assessment and ensure that they are appropriate for identifying the likely significant effects of the Proposed Development, with support of appropriate figures. Study areas should be established in conjunction with	The geographical extent of the search areas for biodiversity information was related to the significance of ecologically valuable receptors and their sensitivity to environmental change, the nature of the proposals, potential impact pathways such as air and water pollution, and potential

[11] Scoping Opinion: Proposed Oxfordshire Strategic Rail Freight Interchange. Case Reference: TR050008, July 2021.
[12] Oxfordshire Strategic Rail Freight Interchange– TR050008. Oxfordshire Rail Freight Ltd. Section 51 advice regarding draft application documents. Issued 14 November 2025.

Planning Inspectorate Comment Summary	Response
other relevant aspect assessments, such as air quality. The ES should also make use of Natural England Site of Special Scientific Interest (SSSI) impact risk zones and consider impact pathways to determine the likely indirect effects on designated sites, rather than focus on a defined study area to determine likely significant effects.	Zones of Influence[13] which might arise during the construction and operation phases. Natural England's SSSI Impact Risk Zone (IRZ) Tool was used (via the MAGIC website)[14]) to determine whether the type and scale of the Proposed Development was considered by Natural England to have the potential to affect statutory designated sites of International and National Importance[15].
Field Surveys: ID 4.4.4 The ES should set out the methods and guidance employed for field surveys, in addition to CIEEM guidance[16], the results of these baseline surveys and discuss the methodologies with the relevant conservation bodies. Any limitations or difficulties encountered during the survey should be fully described. The temporal and spatial extent of field surveys should also be described and be sufficient to provide a baseline for the assessment of all the land affected within the redline boundary.	The field survey methodologies and results for each target species and faunal group and any limitations or difficulties encountered during surveys are summarised within Section 4 of this chapter and are discussed in further detail within the relevant Appendices (Appendices 6.1-6.8). Natural England has been consulted with regard to survey effort, results, mitigation, and enhancement, including licencing requirements as appropriate.
Ancient Woodland and Veteran Trees: ID 4.4.5 Given the location of the Proposed Development and potential for effects on Ancient Woodland, the Applicant should scope in potential effects on this habitat. The ES should confirm whether any mature trees are considered to be veteran trees, and address these as specific receptors where significant effects are likely to occur.	The potential effects of air pollution and dust acting on off-site ancient woodland habitats is discussed within Section 6.5. Four trees were identified as veterans based on the NNPS definition of a veteran tree. Of these three will be retained and afforded an enhanced root buffer equating to at least 15x the stem diameter, or 5m beyond the canopy, whichever is the greater, in accordance with industry guidance[17]. The fourth tree, T93 is required to be removed to enable the proposals, therefore a bespoke Veteran Tree Strategy is provided appended to the HMMP that details compensatory measures proposed for this loss and of trees that meet the lower threshold to qualify as veterans under the Biodiversity Gain Requirements (Irreplaceable Habitat) Regulations 2024. The CEMP furthermore specifies precautionary working methods to be adhered to in order to avoid direct and

[13] Zone(s) of influence are the areas over which ecological features may be affected by the biophysical changes caused by the proposed project and associated activities (CIEEM, 2019).
[14] https://magic.defra.gov.uk/MagicMap.aspx
[15] Natural England. 2019. Impact Risk Zones for Sites of Special Scientific Interest – User Guidance.
[16] Chartered Institute of Ecology and Environmental Management (CIEEM) 2018. *Guidelines for Ecological Impact Assessment in the UK and Ireland, Terrestrial, Freshwater Coastal and Marine*. Version 1.3, updated September 2024.
[17] Lonsdale, D. (Ed.). 2013. Ancient and other veteran trees: further guidance on management. London: The Tree Council. Read, H. 2000. Veteran Trees: A guide to good management. English Nature, Peterborough.

Planning Inspectorate Comment Summary	Response
	indirect harm to the tree during construction, including details of barriers or signage to be deployed as appropriate. As such no potential significant effects to the veteran tree resource are considered likely. No ancient woodland is present within the Application Site. Two ancient woodland stands are located directly adjacent the Order Limits however both are located over 15m from the closest section of proposed development and will be buffered by significant green infrastructure. No significant direct or indirect impacts to ancient woodland are identified.
Effects on Designated Sites: ID 4.4.6 In line with the key principles from CIEEM guidance5, the ES should detail the steps taken to avoid impacts on protected sites before mitigation and compensation are considered.	This chapter identifies the steps to be taken to avoid impacts on protected sites.
Desktop Study and Baseline: ID 4.4.7 The ES should describe the sources and dates of data used to inform the baseline desktop study.	These are provided in Section 6.2 and Appendix ES6.1.
Future Baseline: ID 4.4.8 The ES should consider the objectives of the relevant Oxfordshire Conservation Target Area (CTAs)[18] regarding land use, management and biodiversity enhancements to inform the future baseline evaluation. The future baseline should also consider future changes within areas currently being quarried or that are proposed for mineral extraction.	The future baseline is discussed within Section 6.4 and encompasses consideration of CTAs and the subsequently adopted Oxfordshire Local Nature Recovery Strategy (LNRS), in addition to adjacent (off-site) areas currently undergoing mineral extraction and those areas proposed for future extraction works.
Loss of Habitat, Fragmentation and Indirect Effects: ID 4.4.9 In addition to direct loss, the ES should also consider the indirect effects on habitats due to fragmentation.	Indirect effects on habitats due to fragmentation are considered within Section 6.5.
Disturbance to Protected Species: ID 4.4.10 The ES should address the potential for disturbance effects on legally protected species due to noise, emissions, pollution, loss or fragmentation of habitats, lighting and effects on foraging or commuting behaviour.	Indirect effects on legally protected species due to noise, emissions, pollution, loss or fragmentation of habitats, lighting and effects on foraging or commuting behaviour are considered within Section 6.5.
Habitats of Principal Importance: ID 4.4.11 The ES should specifically reference and take into account the UK List of Priority Habitats and Species present within the redline boundary, such as broadleaved woodland,	All relevant HPIs are considered within this chapter, with full survey data reported within the supporting Ecological Appraisal Report (Appendix ES6.1) and associated technical Reports (Appendices 6.2-6.8).

[18] Wild Oxfordshire 2020. https://www.wildoxfordshire.org.uk/biodiversity/conservation-target-areas/

Planning Inspectorate Comment Summary	Response
hedgerows, ponds, lowland grassland and arable field margins. It should be made clear which broadleaved woodland habitat the effects relate to, with reference to the published list of Habitats of Principal Importance (HPIs).	
Direct and Indirect Effects on Statutory Designated Sites: ID 4.4.12 The ES should set out what effects on statutory designated sites have been assessed, including both direct and indirect, secondary, cumulative, and temporary and permanent effects from both construction and operation of the Proposed Development. The ES should also consider the potential for indirect effects on other statutory designated sites outside of the redline boundary where a receptor pathway exists. The consideration of effects on statutory designated sites should also be carried out in conjunction with other relevant aspect assessments such as noise or air quality.	The potential effects on statutory designated sites included within this assessment are detailed within Section 6.5. These include effects during development construction and operation and incorporate indirect effects such as potential effects on noise and air quality.
Effects on Areas Outside of the Main Site: ID 4.4.13 The ES should detail the likely receptors for works affecting elements of the development within the entire redline boundary, and those potentially indirectly affected but outside the redline boundary such as effects of changes in air quality on designated sites.	This Chapter considers ecological receptors throughout the Application Site and those that are located outside the Application Site but potentially would be indirectly affected, including off-site designated sites within the relevant Zone of Influence.

Comments received regarding the sHRA	
Description of proposed works. The proposed development description is not consistent with the authorised development described within the submitted draft Development Consent Order (dDCO).	The sHRA report has been updated to refer to the correct and consistent description of development (Appendix 6.10, Section 1).
The shadow HRA should be supported by an appropriate plan to identify the proposed development that has been the subject of the assessment and to identify the location of the designated site(s) in relation to the proposed development.	The updated sHRA includes an appropriate plan as described (Figure 1 within Appendix 6.10).
Distance from site. The shadow HRA should set out the reasons for the selection of the proposed 13km and 17km study areas used to identify the site screened in for likely significant effects. Review the study area to identify whether impact-pathways to other designated sites should be considered in the assessment - to consider the potential for sites supporting mobile species at greater distances from the proposed development.	The sHRA has been updated to include clarification of the points raised (Appendix 6.10, Section 2).

Planning Inspectorate Comment Summary	Response
On-site and off-site impacts. Consider a wider scope of potential impact pathways on designated sites, for example of potential for likely significant effects from emissions to air as a result of the construction and operation of the proposed development, including potential changes to both rail and road emissions.	Potential impact pathways including airborne pollutants are discussed within Section 6.5.
Alone assessment. The alone assessment should be updated to take account of the points made above. The conclusions that any potential impacts would be mitigated by distance and intervening habitats should be justified with reference to each impact-pathway and qualifying feature. Where potential LSE alone are assessed, an in-combination assessment of LSE should also then be provided.	The sHRA has been updated where relevant. No in-combination assessment is required as no impacts are anticipated (Appendix 6.10, Section 4).
Reference should be included to the consultation undertaken, particularly with Natural England, and any feedback on the conclusions of this assessment received, particularly where it can be demonstrated that agreements have been reached on the outcomes of the assessment.	A summary of consultation undertaken with NE and other consultees is provided in the section below and includes cross-reference where appropriate to other documents within the submission.
Consider restructuring the shadow HRA in order to take account of all the points raised.	The sHRA document has been restructured for greater clarity.

Stage 1 Non-Statutory Consultation

6.2.30. A summary of responses from further consultations undertaken following the initial (non-statutory, Stage 1) public consultation are provided in Table 6.5.

Table 6.5 Summary of Consultee Responses Following Stage 1 Public Consultation

Body/Organisation	Comment Summary	Response
Cherwell District Council	BNG assessment should seek to go beyond minimum expectations and concerns Parameters Plan shows Landscape/Green Infrastructure primarily as mitigation and not as planned strategic environmental gain.	A BNG assessment using the Statutory Biodiversity Metric calculator has been undertaken (Appendix 6.9). The Proposed Development has taken into consideration the location within the Ardley & Heyford CTA and the recently released Oxfordshire LNRS and opportunities for biodiversity net gain have been identified and

Body/Organisation	Comment Summary	Response
		incorporated throughout the scheme design.
Cherwell North District CPRE Oxfordshire	Request BNG assessment is shared in entirety using DEFRA 3.0 calculator	A detailed BNG assessment has been undertaken using the Statutory Biodiversity Metric calculator (v.1.0.4) – see (Appendix 6.9).
Oxfordshire County Council Report for Cabinet	Request that following update surveys the BNG is re-calculated using latest 3.1 version of the Defra metric. Consideration of greater detail of mitigation for bats, badgers, GCN, birds, reptiles and grassland within SSSI. Request for further detail on measures to prevent and reduce construction and long-term impacts on SSSI and nearby LWSs to be covered in greater detail in a CEMP.	A BNG assessment has been undertaken using the Statutory Biodiversity Metric calculator. Further detail of mitigation for fauna and grassland within SSSI within the updated assessment detailed within sections 6.5 and 6.6. Mitigation and design of GI. Further consideration of impacts to the Ardley Cutting and Quarry SSSI and associated LWS within the updated assessment detailed within sections 6.5 and 6.6. CEMP document has been prepared (Appendix 2.3).
Forestry Commission	Concern over potential impact of proposed development on woodlands. Consideration of government policy in relation to irreplaceable habitats e.g. ancient woodland. Consideration to strengthen/buffer existing woodland.	No ancient woodland is being removed. A single tree meeting the NNPS definition of veteran is to be removed, in addition to 27 other trees that qualify as Irreplaceable Habitats under the Biodiversity Gain Requirements (Irreplaceable Habitat) Regulations 2024. The Veteran Tree Strategy details the proposed mitigation for these removals to maintain cut material within the Application Site in a manner that continues to contribute to the deadwood and veteran tree resource. Further consideration of impacts to woodland and consideration of policy within updated assessment. Additional woodland planting proposed site wide. Mitigation and design of GI will overall enhance woodland cover.
Berks, Bucks & Oxon Wildlife Trust (BBOWT)	Concerns of removal of part of the Ardley Cutting and Quarry SSSI. Consideration of impacts on visitors to Ardley	Bespoke mitigation for the loss of SSSI qualifying habitats has been agreed with NE in conjunction with a commitment to the long-term (80

Body/Organisation	Comment Summary	Response
	Wood Quarry Nature Reserve (part of the SSSI) due to altered landscape, noise, pollution. Consideration of indirect impacts to the Nature Reserve due to new footpath proposal. Concern of impacts to other LWS in terms of habitat loss, recreational impacts and general construction impacts. Concern regarding loss of greenfield land and hedgerows. Concern over fragmentation of CTA. Request of minimum 20% BNG and habitat creation to mitigate loss of SSSI considered separately. Concern about lighting impacts on wildlife. Request full lighting strategy.	years) management of compensatory habitats. Further consideration of impacts to the Ardley Wood component of the Ardley Cutting and Quarry SSSI, and hedgerow loss within the updated assessment detailed within sections 6.5 and 6.6. Potential construction and operational impacts to Ardley Wood Quarry are discussed within Section 6.5. CEMP document prepared detailing appropriate precautionary construction working practices. 10% net gain is not yet mandatory for NSIP sites, nevertheless the BNG assessment undertaken demonstrates the proposals can achieve a net 10% gain across on-site habitats, hedgerows and watercourse habitats. Chapter 8 details lighting strategy.
Dorchester Living	Request further clarification regarding aquatic ecology and future baseline. Concern over air quality impacts which remain to be assessed. Concern over removal of part of CTA and if mitigation is sufficient to reach CTA targets. Concern over long-term impacts to SSSI. Inconsistencies over assessment of data for barbastelle bat.	Further consideration within the updated assessment. The WFDA (see Appendix ES9.5) also provides some baseline data for on-site watercourses. The potential effects on air quality and resulting impacts on ecological receptors are considered in Section 6.5. Further consideration of fragmentation of the CTA and long-term impacts to the SSSI are provided within Sections 6.5 and 6.6. Updated assessment of the local bat population is detailed within section 6.5 and Appendix ES6.3 including the results of a series of targeted barbastelle trapping surveys undertaken in May, July and late August 2025.

Body/Organisation	Comment Summary	Response
Mid-Cherwell Neighbourhood Plan Forum	Concern over impacts on flora and fauna, including Ardley Wood within the Ardley Cutting and Quarry SSSI.	Further consideration within this updated assessment.

Natural England pre-application Discretionary Advice Service (DAS)

6.2.31. Natural England have been engaged to provide guidance via their pre-application Discretionary Advice Service (DAS) on the Proposed Development with regard to the potential impact on i) Ardley Cutting and Quarry SSSI, and ii) protected species within and adjacent to the Application Site. Meetings were held with Natural England in March and October 2021, September 2022, October 2025 and January 2026.

6.2.32. The initial consultation resulted in a Letter of No Impediment (LONI) for protected species (GCN and badger) being issued on 01/02/23 based on the development proposals current at the time and prior to the scheme being temporarily paused by the Applicant. Natural England have subsequently confirmed that the LONI has no expiration date providing survey data is maintained up to date and that any such updates align with the results previously submitted to Natural England during their initial assessment and granting of the LONI.

6.2.33. Feedback from the discussions with Natural England undertaken via the DAS is summarised in Table 6.6.

Table 6.6 Summary of Natural England Correspondence via the DAS

Summary of Comments / Discussion Points
Meetings in 2021
Network Rail Land Access Constraints NE acknowledged that securing access to Network Rail land can impose constraints with regard to survey timing and physical extent. An interim approach was agreed in the absence of access to NR SSSI land whereby the initial survey in 2021 was undertaken from adjoining land.
Compensation for impacts to Ardley Cutting and Quarry SSSI NE confirmed they required a bespoke scheme of compensation to be devised suitable to ensure that there would be no loss in overall area of priority habitats. Compensation for the loss of SSSI area would have to be compensated for by the creation of an area of at least equivalent size. Agreed that a substantial area of exposed substrate on new cutting banks would be created, exposing calcareous sub soils suitable for establishment

Summary of Comments / Discussion Points	
of species-rich calcareous grassland. Potential to incorporate locally sources green hay to be explored.	
Alternative Site Assessment NE highlighted the importance of following the mitigation hierarchy, including demonstration via an Alternative Sites Assessment that potential impacts on the SSSI cannot be avoided by locating the project elsewhere.	An Alternative Sites Assessment is provided within Chapter 2: Proposed Development and Appendix ES2.4).
Agricultural Land Classification and Soil Assessment NE advised that these non-ecology matters are required to form part of the project assessments.	Agricultural land classification and soils are considered within Chapter 11: Ground Conditions.
Meadow Clary NE highlighted the requirement to consider potential impacts to the meadow clary present within Ardley Road Verge Nature Reserve DWS.	No direct impacts to the meadow clary population are anticipated. Potential indirect impacts are considered within Section 5 of this chapter, and an appropriate programme for translocation of individual plants is included within the Habitat Management and Monitoring Plan (HMMP) (Appendix ES6.11) for implementation in the event adverse effects cannot otherwise be avoided. Opportunities to expand the current distribution via inclusion of meadow clary seed within calcareous grassland mixes will also be actioned.
Meetings in 2022	
Mitigation Hierarchy Reiterated the requirement to demonstrate that the Mitigation Hierarchy has been followed. Requested that any other designs that were considered during the design process are outlined. Client confirmed that due to stringent requirements regarding rail access speeds etc. imposed by Network Rail, the options for the site location were very much influenced by road & rail access as well as topography etc.	See the Alternative Sites Assessment within Chapter 2: Proposed Development and Appendix ES2.4). Within-site considerations are discussed in Section 6.5.
Ardley Cutting and Quarry SSSI Review of the proposed bridleway sections in the vicinity of the SSSI and sections under the by-pass required with regard to	Potential indirect impacts to the SSSI as a result of increased public access are discussed in Section 6.5.

Summary of Comments / Discussion Points	
potential impacts on the SSSI as these will open up new areas of the site to the public. NE highlighted the need to assess anticipated habitat loss as a result of the Ardley Bypass bridge over the rail tracks and of indirect impacts due to reduced light levels and rainfall post construction. Habitat loss and impacts within the SSSI must be addressed, and appropriate mitigation provided. Opportunities to establish new priority habitats (i.e. calcareous grassland) to be explored and appropriate long-term management to be allied in areas free from the current access restrictions currently applying to the SSSI within Network Rail ownership.	Impacts are discussed in Sections 6.5 and 6.6, and direct and indirect impacts are quantified within the BNG assessment in terms of habitat loss and future habitat condition. The scheme will deliver substantial areas of calcareous grassland and also lowland meadow within close proximity to the SSSI, as detailed within Sections 6.5 and 6.6 and as demonstrated within the BNG Assessment (Appendix ES6.9). Areas providing compensation for loss of SSSI habitats will be appropriately managed for a period of not less than 80 years, as detailed within the HMMP (Appendix 6.11)
Geological Interest features NE concern that features of geological interest be fully considered within the proposals. Agreed in principle that the new cuttings and embankments would likely create opportunities for new geological features of importance to be exposed.	Geological Interest features are considered within Chapter 11: Ground Conditions
Biodiversity Net Gain NE recognise there are significant challenges to securing net gain when there is unavoidable loss to SSSI habitats. The presence and objectives of the Ardley and Heyford Conservation Target Area (CTA) must also be appropriately taken into account. A site-wide net gain is required, and the highest strategic significance applied to target habitats within the CTA.	The CTA targets, namely: calcareous grassland, hedgerows, grassland management, GCN and geological conservation have been taken into account and are addressed within this chapter and Chapter 11: Ground Conditions. FPCR confirmed the BNG calculations were being undertaken on the basis of every hectare of SSSI habitat lost (regardless of composition or quality) would be replaced with 1ha of calcareous grassland, as previously discussed. Provision of a bespoke agreement for SSSI habitat compensation for the purposes of the BNG metric was proposed. It was noted that the developer will likely not have full control over the management of planted areas within land controlled by National Highways land. FPCR proposed this be considered within the bespoke agreement.

Summary of Comments / Discussion Points	
	An outline of the proposed bespoke approach was subsequently issued to NE (21.10.22).
Protected Species NE protected species team confirmed the general proposals re GCN mitigation were acceptable and agreed to issue a LONI for the species, with any remaining issues outlined as caveats within the LONI. NE protected species team confirmed the general proposals with regard to badger mitigation were acceptable and agreed to issue a LONI on the basis of information submitted, with any areas requiring further confirmation detailed as caveats within the LONI to be addressed.	FPCR provided further details regarding provision of GCN receptor areas, the use of exclusion fencing during construction, and the anticipated duration of the fencing/exclusion period. It was confirmed the overall mitigation areas within the site will extend beyond the 250m licensable area. The bat licence documents were not yet at a stage where they could be reviewed, however FPCR confirmed only a small number (total <3) common pipistrelle and brown long-eared bat non-breeding roosts would be impacted. No tree roosts have been identified within the proposed works area. The scheme design will be informed by field data and aim to minimise impacts to main commuting corridors.
Meeting October 2025	
Ardley Cutting and Quarry SSSI NE raised the requirement that potential impacts to the SSSI resulting from the presence of idling diesel trains were considered in terms of air quality and potential impacts to the SSSI.	Potential air quality effects from diesel trains are considered within Chapter 4: Air Quality and within Section 6.5 of this chapter.
Detailed plans showing the extent of impacts to SSSI habitats are required and area values are to be confirmed.	An overview of habitat areas is included within Section 6.5, with full details including plans provided within Appendix ES6.9: Biodiversity Net Gain Assessment
BNG Strategy This is to take into consideration the Oxfordshire LNRS (still draft at the time). The mitigation proposals relating to SSSI habitats and the mechanism/s by which mitigation will be secured need to be considered separately from the strategy for the remainder of the proposals.	The Oxfordshire LNRS has now been published and has been used to inform the BNG assessment above and project design. The HMMP (Appendix ES6.11) details the proposals specific to the compensation provision for SSSI habitats, and associated management and monitoring commitments.
Recreational impacts The location of new public footpaths must take potential disturbance impacts to ground nesting birds into account and minimise such impacts.	The field compartments supporting the main areas of open grassland will be appropriately fenced and therefore not accessible to the public. The fencing will be relatively low level (so as not to

Summary of Comments / Discussion Points	
	encourage perching raptors etc.), and the lower levels reinforced with wire mesh to prevent dogs accessing these fields.
Hydrological connectivity to off-site habitats Potential impact pathways to off-site woodland and other priority habitats are to be considered within the assessment.	Discussed in Section 6.5.
Mitigation Hierarchy The constraints to the design of the new rail track cutting were discussed, as were the opportunities these create for management of newly created priority grassland outside of Network Rail land to be brought into sensitive long-term management.	
Advised that consideration is given to the geological interest features of the SSSI	Geological Interest features are considered within Chapter 11: Ground Conditions
Recommended the Air Quality team utilise the DAS process to consult directly with the NE team.	
Meeting 16.01.26	
Bat LONI Confirmed the LONI could be determined in tandem with the DCO determination timeframe. A LONI for bats was subsequently issued on 30/04/26). This confirmed that "on the basis of the information and proposals provided, Natural England sees no impediment to a licence being issued, should the DCO be granted".	
GCN LONI NE confirmed they had no immediate concerns regarding the mitigation proposals. Proposed trapping distances and trapping periods, culvert use and design, habitat creation, receptor area locations close to respective metapopulations, and use of permanent fencing were discussed. FPCR outlined how each of the caveats listed within the GCN LONI have or will be addressed NE requested that trapping effort be focussed on areas with high suitability habitat. Any proposed trapping periods less than standard guidance are to be justified, for example on the basis of poor habitat quality and barriers to dispersal. Confirmed trapping periods stated within the licence documentation can be revised should trapping rates be very low within individual trapping areas, where five or more days are clear of GCN captures.	
Badger LONI Agreed the provision of an increased number of artificial setts as close as possible to closed setts would help minimise the additional movement of badgers and associated elevated risk of spreading bovine tuberculosis. The location of sett provision should take into account the distribution of neighbouring territories. An overview of the proposed design of artificial sett construction was discussed and agreed.	
Biodiversity Net Gain FPCR confirmed the recently released Oxfordshire LNRS priority areas have been taken into consideration within the green infrastructure proposals and have been inputted into the BNG mapping. New species-rich grassland areas are to include suitable food plants for priority butterfly species including those recorded present within Ardley Cutting and Quarry SSSI.	

Summary of Comments / Discussion Points	
Proposed Development Design and Layout Request to consider design and layout options that avoid harm to Ardley Cutting and Quarry SSSI and enable retention of features. Recognition that some design elements are fixed due to existing infrastructure. Request to show how the mitigation hierarchy has been applied, and alternative design options considered. Quantification of unavoidable habitat loss.	Consideration of alternative designs detailed within Chapter 2: Proposed Development and within section 6.5. Direct habitat loss is quantified within the updated BNG assessment and accompanying BNG Report (Appendix ES6.9).
Highway Works Note significant earthworks required to facilitate the bypass bridge over the Chiltern Main Line. Request further detailed design information regarding extent of works and habitat retention.	Significant earthworks are not required for the bridge over the Chiltern Main Line as the railway is already set in a deep cutting at the location of the bridge. The overall alignment of the Ardley Bypass is shown on the Highway Plans Long sections Sheet 06 (Document 2.7S). The earthworks will be local to the structure as shown on the Bridge Plan (Document 2.12B)
Permanent Way Note significant earthworks required for installation of permanent way which will result in loss of habitat, particularly at eastern and westernmost parts of Unit 2 of the SSSI. Further detailed design information requested detailing extent of works to these sections of southern embankment and how habitat will be retained during construction. Request of further information regarding potential design alternatives to layout and design of permanent way.	Detailed earthworks and levels strategy relating to the rail terminal and rail connections are provided on the Rail Plans (Document series 2.11). Consideration of alternative designs detailed within Chapter 2: Proposed Development
Rights of Way Concern indicative alignment of new section of bridleway under B340 bypass will result in additional loss of existing habitat from potential cutting of embankment. Request further information regarding design alternatives to avoid additional loss. Concern of new bridgeway south of the new tracks to run through Unit 3 of the SSSI and new section south of Chiltern Main Line/Sommertown Road through the SSSI to Quarry Cottages Lane and loss of	SSSI losses have been minimised, and calcareous grassland provision will vastly exceed the areas of loss from the SSSI, as detailed in the BNG Report Appendix ES6.9. At the location of the Ardley Bypass the bridleway moves closer to the railway line so it can pass under the same bridge as the railway as shown on the Bridge Plan (Document 2.12B). This is done to avoid constructing and maintaining a separate underpass for the bridleway north of the railway.

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calcareous grassland. Further design information requested for both sections.	Detailed design drawings of these areas and details of alternative Proposed Development design / alternative PRoW locations are provided within the Highway DAD (Document 5.5C) and on Rights Of Way Plans (Document series 2.3). The geological exposure within Unit 3 will be lost, however the new cutting will create a larger expanse of new exposure through adjacent rock, see Chapter 11: Ground Conditions and Appendix 11.9.
Indirect Impacts Request further information with regard to potential impacts on the hydrology of the SSSI, impacts from lighting, air pollution and likelihood of increased public access. Recommend consideration of long-term management and maintenance provisions as part of an appropriate Management Plan.	Potential impacts to the SSSI including potential affects from air pollution are discussed and further assessment of increased public access is included within Section 6.5. Long-term management and monitoring detailed within the HMMP Appendix ES6.11.
Ecological Survey Statement to comment on further botanical and invertebrate survey data in due course.	Updating botanical and butterfly surveys scheduled were completed during appropriate survey seasons in 2025 and are fully considered within the assessment.
Geology Request of strategy which sets out how geological features of interest are maintained and suggestion of opportunities to create new exposures in rock face.	Comment is addressed within the assessment detailed in Chapter 11: Ground Conditions
Biodiversity Net Gain Request that a bespoke arrangement for BNG is required given direct loss of SSSI habitat. Statement to provide further advice upon receival of additional information outlining BNG approach to date, including potential compensation ratios and trading options.	The BNG assessment has been updated using the Statutory Biodiversity Metric calculator as detailed within the BNG Report (Appendix ES6.9) and associated plans. A bespoke management plan for habitats provided to compensate SSSI losses is provided in Appendix 6.11.
Meeting 29.07.26	
Assessment of Impacts Request that impacts on ecological receptors first be considered independently of additional green infrastructure, and then secondly with such compensation included.	This chapter has been reformatted such that green infrastructure provided specifically to mitigate ecological impacts are considered separately from the site-wide green infrastructure embedded within the scheme design.
SSSI Compensation	To ensure all habitat prescriptions are encompassed within a single management

Summary of Comments / Discussion Points	
Clearly separate out the SSSI compensation strategy and confirm how this is to be legally secured over the course of the 80-year management period.	document the HMMP for the full site includes a section that details the SSSI compensation strategy and legal mechanism by which this will be secured. A separate Appendix to the HMMP has also been included however, that sets out the SSSI compensation strategy within a stand-alone document.
Email of 20.08.26 (appended to Applicant's response to the Local Impact Report (Document 11.6)) Gagle Brook - Use of overlarge culvert vs hop-overs for bats NE confirmed they would likely favour the use of an underpass to maintain the existing commuting routes that the bats are using along Gagle Brook under the MSRR rather than hop-over trees. They referenced O'Malley et al. (2025) as evidence of the key risks with regard to barbastelles and hop-over use within the wider context of other sources including guidance from EUROBATS (Publication Series No.10).	

Stage 2 Consultation Comments Received

6.2.34. Consultee comments received from statutory consultees (other than Natural England) following the Stage 2 submission of draft documents are summarised below, together with summary responses where appropriate.

Table 6.7 Stage 2 Consultation: Summary of Consultee Comments Received

Consultee / Comment	
OCC/CDC Ecology and Arboriculture comments	
Mitigation Hierarchy Further clarification should be provided on how the mitigation hierarchy has been applied to each of the ecological receptors identified at the application site level. The extent of habitat losses from the Ardley Cutting and Quarry SSSI needs to quantified, with plans demonstrating the quantity and quality of habitat to be created and enhanced to mitigate impacts. Other designated sites, ecologically important hedgerows, and protected and notable species also to be considered in terms of potential impact pathways.	Details regarding the application of the mitigation hierarchy are provided in Section 6.5. Habitat losses and gains are summarised in Section 6.5, and in further detail within the BNG Report Appendix ES6.9. Potential impact pathways to IEFs including Ardley Cutting and Quarry SSSI are discussed in Section 6.5.

Consultee / Comment	
Woodland, Ancient Woodland and Veteran Trees Assessment to consider indirect impacts to trees. Further detail required demonstrating consideration of opportunities to enhance connectivity between woodlands to increase resilience. The quantity of tree/woodland/hedgerow habitat loss and corresponding new planting proposed needs to be clarified, based on the details of the final scheme. Information should also be provided on how many of the trees proposed to be removed are ash trees and might be lost to Ash die-back in the foreseeable future. Consideration to be given to the type and quality of trees, and tree planting should reflect the local landscape character, e.g. the creation of woodland blocks.	No ancient woodland is present within the Application Site, and no significant direct or indirect impacts are identified to neighbouring ancient woodland stands present within the local area. Habitat losses and gains are summarised in Section 6.5, and in further detail within the ES6.8: Arboricultural Assessment and the BNG Report Appendix ES6.9. Veteran trees are specifically considered within the Veteran Tree Strategy appended to the HMMP (Appendix ES6.11). The implications of ash dieback are discussed within Appendix ES6.8.
Oxfordshire LNSR It is welcomed that Conservation Target Areas have considered within the assessment undertaken, however regard should also be given to the Oxfordshire LNRS due to be published imminently.	Relevant LNRS strategy priorities identified and prioritised within the BNG assessment and the green infrastructure design.
Hedgerows Clarification to be provided on the extent of hedgerow habitat proposed to be removed.	Confirmed within Section 6.5 and within the BNG Report: 11.77km hedgerow is to be removed, 14.16km species-rich hedgerow to be created.
Protected/Notable Species All ecological survey results are required to be complete and in date in line with best practice guidelines and licencing requirements. Any deviation from best practice guidelines require explanation and justification should be provided. Survey areas should be provided for all species including badgers, otters and water voles. Further justification is required to justify dormouse surveys being scoped out. Requested that watercourses be subject to an assessment for aquatic fauna and flora to help understand the impacts of the development on watercourses and inform further management and mitigation requirements.	Updated field data is presented within the Ecological Appraisal Report Appendix ES6.1 with details referenced within Section 6.4 where relevant. Provided within Section 6.4. Provided within Section 6.4, including details of water vole, otter and habitat surveys. Justification provided for scoping out targeted surveys for fish and aquatic macroinvertebrates.

Consultee / Comment	
GCN Confirmation should be provided which waterbodies were surveyed for GCN in 2025. Provide further detail to outline how GCN metapopulations were defined. Justification should be provided to explain the proposed fencing locations and duration. Identify proposed culvert locations. Ensure all caveats of the Natural England GCN LONI are fully addressed. Clarify how connectivity of suitable terrestrial habitat will be maintained/enhanced to mitigate and compensate for impacts to metapopulation 3.	See the detailed discussion within Appendix ES6.4: Great Crested Newt Report. Some final details of the mitigation strategy could be subject to change subsequent to the DCO process, dependent on the requirements of NE licencing and the details specified within the agreed licence documentation.
Bats Justify the survey area undertaken for assessing trees with suitability for roosting bats. Consider indirect impacts of the proposals offsite and also lighting impacts on sensitive species such as barbastelle. Clarify which flight lines are considered important for foraging and commuting bats with impact pathways to the proposals and how they will be specifically addressed through mitigation and compensation measures if avoidance is not considered feasible.	See the detailed discussion within Appendix ES6.3: Bat Report.
Badger The proposed locations of the artificial setts and their specifications are required. Further detail should be provided to justify the design of the culverts proposed including their proposed locations. All points raised in the LONI should be addressed in the submitted badger report and clear reference should be made to where this has occurred within the report.	Further detail regarding the specifications of the proposed artificial sett provision and the dimensions and locations of culverts are provided within the confidential Badger Report Appendix ES6.6.
Birds The current mitigation proposed – grassland open space around the main site and a field with cover crop with five skylark plots is considered insufficient to mitigate the identified level of impact. Provision of a standalone farmland bird mitigation scheme would allow appropriate assessment of the scale of mitigation required.	Additional land has been brought into the Application Site and habitat provision suitable to support farmland birds has been substantially increased. Sensitive habitat management will also be employed in order to mitigate habitat losses. See Sections 6.5 and 6.6.

Consultee / Comment	
SSSI Butterflies and Invertebrates A standalone mitigation strategy for butterflies and invertebrates should be committed to both within and outside the SSSI, with ongoing monitoring and management adjustments as required.	The proposals now encompass more substantial habitat creation, including 15.44ha calcareous grassland and 5.17ha lowland meadow in close proximity to Ardley Cutting and Quarry SSSI created specifically to compensate impacts to SSSI habitats. In contrast 2.89ha of SSSI habitats are to be lost, of which 1.13ha is encroaching scrub. Species-rich calcareous grassland and lowland meadow will be provided to compensate loss of SSSI habitats and will be secured for an extended period (80 years minimum) that will deliver significant benefits to many invertebrate groups, including several of the SSSI priority butterfly species. As such it is considered that separate stand-alone mitigation strategy for butterflies is not required.
BNG An updated BNG assessment should be provided that considers the final detailed post development design, complete with a BNG metric spreadsheet. A revised BNG report should identify which post development interventions are considered mitigation and compensation regarding impacts to designated sites and protected species. Further justification should be included for the assumption that only habitats in poor ecological condition can be achieved on highways. Increased specificity is requested regarding what habitat interventions are planned and where within the scheme.	Provided within the BNG Report at Appendix ES6.9.
Draft Habitat Management & Monitoring Plan A draft HMMP should be provided to demonstrate the achievability of the proposed post development habitats.	Appendix ES6.11 provides the context and framework for habitat establishment, management and monitoring.
Environment Agency Comments	
Fish and Aquatic surveys Fish and other aquatic ecology (such as macrophytes and macroinvertebrates) have not been included in the Environmental Impact Assessment (EIA).	Justification for scoping out targeted surveys for fish and aquatic macroinvertebrates is provided in Section 6.4.

Consultee / Comment	
Potential impact pathways to be considered include increased noise and runoff of fine sediment and pollutants. The creation of temporary or permanent crossings of watercourses are to be considered, including any culverting of watercourses. The impacts from loss of aquatic habitats and habitat fragmentation are also to be assessed.	Aquatic ecology will be appropriately protected via measures included in the CEMP (and future P-CEMPs, including for the relevant highways works around the M40 J10). Permanent crossings of watercourses including culverts have been designed to minimise the scale of alterations to watercourse channels.
Watercourse Buffers Further detail provided regarding watercourse buffers to be provided.	The proposed buffers (to comprise green infrastructure) are summarised below. • Padbury Brook at J10: culverted under the road infrastructure but otherwise located within generous landscape buffers. • Tributary to Padbury Brook (south of rail track): entirely within GI • Realigned sections of the two tributary stems to Ashgrove Brook will be routed through continuous landscape corridors c.20m width. • Ashgrove Brook within the Main Site will be buffered within a largely continuous habitat corridor of typical width 30-60m.
Otter Otters have not been included as an ecological receptor in Table 6. 14	The chapter has been updated to include otter at all stages of the assessment.
Invasive Non-native Species (INNS) Risk of accidental spread of Invasive Non-Native Species (INNS), such as signal crayfish which were confirmed present within the main Gagle Brook channel. Submit an INNS Management Plan including biosecurity measures as part of the Environmental Statement (ES). Accidental spread of INNS is an offence under the Wildlife and Countryside Act 1981.	It is considered that standard mitigation and best practice measures such as equipment and wheel washing prior to moving off-site incorporated into the CEMP and each P-CEMP will be appropriate to avoid the accidental spread of signal crayfish. No other INNS were recorded present on site.
Watercourse Crossings Provide further detail regarding the detail of the crossing design over the Gagle Brook (Ordinary Watercourse). There is a risk that the physical characteristics of waterbodies will be adversely affected. Consider using an open-span bridge with abutments set back from	A large box culvert is proposed at the Gagle Brook crossing of width 6m and height 3.5m above the water level, with a soft bed, reducing the impact to the channel morphology and allowing natural processes such as sediment movement to continue. A continuous mammal ledge will

Consultee / Comment	
the bank edges to allow for natural sediment movement and reduce the impact to the river morphology.	be provided to enable safe passage for terrestrial fauna at times of stronger flow.
Ministry of Defence (MOD) Raised concerns in relation to potential bird strike risks, specifically relating to the proposed inclusion of photovoltaic panels on roofs, works to the landfill, and the creation of SuDS.	The potential for the Proposed Development to result in an elevated bird strike risk will be addressed and managed through the submission of a Bird Hazard Management Plan (BHMP) that will include appropriate planting/landscaping details to discourage birds where necessary, and measures to prevent nesting on building roofs. The works to the landfill will be confined to historic landfill material that will not be a significant attractant to bird species of concern, such as gulls. The SuDS will be dry features (other than narrow over deepened central channels within some of the basins to provide refuge for GCN) and therefore will not be an attractant for waterfowl. The Applicant has discussed with MoD that an outline BHMP will be submitted by the Applicant in due course.

Limitations and Assumptions

6.2.35. Surveys for mobile faunal species have been undertaken using relevant recommended survey methodologies. Therefore, where species have not been recorded, it has been assumed they are likely to be absent.

6.2.36. The Order Limits evolved incrementally over the course of the survey period following the initial surveys undertaken in 2018. The extent of surveys on each occasion reflected the boundary of the proposals at the time as accurately as possible; however, pre-2025 there were some limitations to access to land controlled by third parties and to land closely adjacent to existing highways. These areas are relatively small and, with the exception of sections of roadside verge alongside junction 10 of the M40 that were inaccessible due to health and safety restrictions, could be adequately accessed during the updating surveys completed in 2025. As such the previous minor restrictions to access are not considered to represent a constraint to the overall robustness of the field data recorded.

6.2.37. Given the timing of the evolution of the Proposed Development with regards to the location and extent of the Highway Works area it was necessary for the initial faunal surveys to span both the 2021 and 2022 survey seasons. Updating surveys however were all completed within the same season, i.e. 2025.

6.2.38. Detailed inspection of the farm buildings was limited in places due to safety restrictions and the absence of access hatches into some roof voids. These limitations have been considered within the assessment of individual buildings with regard to bat roost potential, and the resulting proposed mitigation has accounted for this constraint.

6.2.39. Small stretches of the Ashgrove Brook (a tributary of Gagle Brook), and the Padbury Brook Tributary were inaccessible due to dense bankside vegetation. However, it was considered that a sufficient proportion of these watercourses were surveyed on each occasion to determine the likely presence/ absence of water vole and otter.

6.2.40. Some small areas of habitat within the northern part of the Highway Works in the vicinity of Junction 10 of the M40 were potentially suitable to support reptile species but could not be safely accessed for reptile survey. Similarly, grassland and scrub cover alongside the embankments of the active railway track were not accessible for survey due to Network Rail access restrictions. Surveys did however encompass similar neighbouring/ contiguous habitats, and the assessment takes limitations to survey access into account to address the potential underestimation of local reptile populations.

6.2.41. Arboricultural surveys have been carried out from ground level to an appropriate level to determine existing trees' arboricultural value, based on their current condition and quality and enable classification.

6.3 POLICY CONTEXT

National Context

National Networks National Policy Statement (NNPS March 2024)

6.3.1. Aspects of the above policy considered to be of relevance to the ecology of the Application Site and/or study area are summarised below.

6.3.2. The NNPS sets out the need for, and government's policies to deliver, development of Nationally Significant Infrastructure Projects (NSIPs) on the national road and rail networks in England referred to as national road, rail, and strategic rail freight interchange (SRFI) developments. Core to this is the Government recognition that for development of the national road and rail networks to be sustainable these should be designed to minimise social and environmental impacts and improve quality of life.

6.3.3. Section 5: Biodiversity and Nature Conservation (paragraphs 5.43-5.69) of the NNPS sets out how impacts should be considered.

6.3.4. Paragraphs 5.46-5.51 state that:

"The applicant should consider the potential direct and indirect impacts on ecosystems including the impacts on habitats and protected species and the interactions between these and provide environmental information proportionate to the likely impacts of the infrastructure on biodiversity and nature.

The applicant should show how the project has taken advantage of opportunities to conserve and enhance biodiversity and geological conservation interests as well as consider how their proposal will deliver biodiversity net gain in line with the requirements in a Biodiversity Gain Statement..."

To avoid direct and indirect harm or disturbance in line with the mitigation hierarchy the applicant should demonstrate that:

• developments are designed to avoid the risk of harm, for example by minimising the footprint of the development and/or retaining the site's important habitat features

• developments are designed and landscaped to provide green corridors and minimise habitat fragmentation (for example using underpasses or green bridges to link habitats)

• during construction, they will seek to ensure that activities will be confined to the minimum areas required for the works

• during construction and operation, best practice will be followed to ensure that risk of disturbance or damage to species or habitats follows the mitigation hierarchy (including as a consequence of transport access

arrangements). *For example, plan for construction work to be carried out at specific times to avoid sensitive times and location, such as the breeding season for wild birds and lifecycles of migratory fish.*

If avoidance or reduction of harm is not possible, applicants should include appropriate mitigation measures, in line with the mitigation hierarchy, as an integral part of their proposed development, including identifying where and how these will be secured in the long term.

If avoidance or bespoke mitigation measures are insufficient or not possible, as a last resort, appropriate compensation measures should be sought and implemented.

The applicant should not just look to mitigate direct harms but should show how the project has taken advantage of opportunities to conserve and enhance biodiversity, having due regard to any relevant local nature recovery strategies and species conservation strategies. Opportunities will be taken to enhance, expand or connect existing habitats and create new habitats in accordance with biodiversity net gain requirements. Habitat creation, enhancement and management proposals should include measures for climate resilience, including appropriate species selection. Maintaining and improving habitat connectivity is important for climate resilience and the biodiversity of ecological networks."

6.3.5. Paragraphs 5.58-5.61 state that:

"The most important sites for biodiversity in the UK are those afforded special protection by the Habitats Regulations. These sites are designated as Special Areas of Conservation and Special Protection Areas and are collectively known as habitats sites. The following should be given the same protection as sites legally protected by the Habitats Regulations: potential Special Protection Areas and possible Special Areas of Conservation, listed or proposed Wetlands of International Importance (*Ramsar sites*)*; and sites identified, or required, as compensatory measures for adverse effects on habitats sites.*

The Habitats Regulations set out a specific process (*see paragraphs 4.14 to 4.18 of the NNPS*) *to assess the likely implications for these sites from a proposed plan or project. To maintain the overall coherence of the National Site Network, such plans or projects may only proceed if the assessment concludes they will not adversely affect the integrity of the site or, in the case of a negative assessment, if there are no alternative solutions, and they must*

proceed for imperative reasons of overriding public interest with the necessary compensatory measures secured.

Many Sites of Special Scientific Interest are also designated as habitats sites and are protected accordingly. Those that are not, or those features of Sites of Special Scientific Interest not covered by an international designation, are given a high degree of protection by the Wildlife and Countryside Act 1981. Most of the land that has been declared by Natural England as National Nature Reserves is also notified as Sites of Special Scientific Interest.

Where a proposed development on land within or outside a Site of Special Scientific Interest is likely to have an adverse effect on a Site of Special Scientific Interest (*either individually or in combination with other developments*), *development consent should not normally be granted. An exception should only be made where the benefits of the development 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. The Secretary of State should ensure that the applicant's proposals to mitigate the harmful aspects of the development and, where possible, to ensure the conservation and enhancement of the site's biodiversity or geological interest, are acceptable. The Secretary of State is bound by the duty placed on all public bodies in section 28G of the Wildlife and Countryside Act 1981 to take reasonable steps, consistent with the proper exercise of their functions, to further the conservation and enhancement of the features by reason of which a site is of special scientific interest.*"

6.3.6. Paragraphs 5.62-5.63 state that:

"Ancient woodland and ancient and veteran trees are irreplaceable habitats. England's ancient woodlands and ancient and veteran trees support high levels of biodiversity. They are home to a quarter of England's priority species for conservation and once lost they cannot be recreated. They also deliver many ecosystem services including clean water and healthy soils, carbon storage, support for people's wellbeing and their long-standing cultural values. The Keepers of Time published in 2022 updates the government's policy to recognise the value of England's ancient and native woodlands and ancient and veteran trees. It restates the government's commitment to evaluate the threats facing these habitats and sets out updated principles and objectives to protect and improve these habitats for future generations.

The Secretary of State should not grant development consent for any development that would result in the loss or deterioration of irreplaceable habitats including ancient woodland and ancient and veteran trees unless there are wholly exceptional reasons (for example, where the public benefit would clearly outweigh the loss or deterioration of habitat) and a suitable compensation strategy exists."

6.3.7. Paragraphs 5.65-5.67 state that:

"Sites of regional and local biodiversity and geological interest, which include Local Geological Sites, Local Nature Reserves and Local Wildlife Sites and Nature Improvement Areas, are areas of substantive nature conservation value and make an important contribution to ecological networks and nature's recovery. They can also provide wider benefits including contributing to the quality of life and the well-being of the community, and in supporting research and education. The Secretary of State should give due consideration to any such harm to the detriment of biodiversity and geological features of regional or local importance which s/he considers may result from a proposed development. However, given the need for new infrastructure, these designations should not be used in themselves to refuse development consent, nevertheless the mitigation hierarchy applies to these sites.

Development proposals provide many opportunities for incorporating beneficial biodiversity or geological features as part of good design103. Nature contributes to the quality of a place, to people's quality of life, the attractiveness of active travel routes and movements, and it is a critical component of well-designed development. Road and rail projects can also play a part in meeting government tree planting and nature recovery targets through partnership working with adjoining landowners, delivering biodiversity, carbon offsetting and social benefits.

Consideration should be given to the impacts on, and improvement to, habitats and species in, around and beyond developments, for wider ecosystem services and natural capital benefits, relevant to the local area and communities. The value of linear infrastructure and its footprint in supporting biodiversity and connecting habitats ecosystems should also be taken into account. Local nature recovery strategies will identify opportunities to create or enhance habitat likely to have greatest benefit to biodiversity and wider environmental improvement. Consideration should also be given to national priorities and targets, such as reduced flood risk, improved air or water quality, and increased access to natural greenspace, or tree planting, woodland creation and protecting long established woodlands."

National Planning Policy Framework[19] (NPPF as amended August 2026)

6.3.8. The NPPF sets out the government's policies for plan making and for making decisions on development proposals in England. It is a material consideration in planning decisions but does not contain specific policies for nationally significant infrastructure projects.

6.3.9. Section 19 of the NPPF: Conserving and Enhancing the Natural Environment provides planning policy guidance including a number of principles which should be applied, including protection and enhancement of biodiversity; provision of measurable net gain for biodiversity; and creating/maintaining coherent ecological networks.

6.3.10. Policies N2 and N6 within Section 19 identify the following principles of relevance to this assessment, including the content of footnotes which are also included below:

N2: Improving the natural environment
2. *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 the development should be refused;*

N6: Areas of particular importance for biodiversity and geodiversity
1. *To support the conservation of important habitats, species and sites of geodiversity value, development proposals affecting:*

a. A site of international importance, which for the purpose of this policy is a habitats site, should be refused unless:

i. An appropriate assessment has concluded that the proposal will not adversely affect the integrity of the site (either individually or in combination with other developments), or the proposal can satisfy the derogation tests[20]; and/or

ii. The impact of development on the relevant protected features of the protected site is being addressed through an Environmental Delivery

[19] Ministry of Housing, Communities & Local Government Local Government 2026. National Planning Policy Framework. Plan-making and national decision-making policies August 2026.
[20] "*These being that there are no feasible alternative solutions to the proposal which are less damaging, there are imperative reasons of overriding public interest for it to proceed, and compensatory measures are secured to ensure that the overall coherence of the network of habitats sites is maintained*" (at footnote 61 in the NPPF).

Plan which has been made and the developer has committed to paying the nature restoration levy.

b. A site of national importance, which for the purpose of this policy is one designated as a Site of Special Scientific Interest, should only be supported if:

i. There would be no adverse effect (either individually or in combination with other developments) on the site's features of special scientific interest; or

ii. The benefits of the development in the location proposed clearly outweigh both the likely impact on the features of special scientific interest, and any broader impact on the national network of Sites of Special Scientific Interest; or

iii. The impact of development on the relevant protected feature of the protected site is being addressed through an Environmental Delivery Plan which has been made and the developer has committed to paying the nature restoration levy.

c. A site of local importance, which for the purpose of this policy is one designated as a Local Nature Reserve or identified as a local wildlife site, local geological site or equivalent in the development plan, should only be supported if:

i. There would not be a significant adverse effect on the integrity of the site; or

ii. The benefits of development in the location proposed clearly outweigh the likely impact on the features which make the site valuable for nature conservation.

2. Irrespective of a site's status in nature conservation terms, development proposals which would entail 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[21] and a suitable compensation strategy exists.

[21] "*For example, infrastructure projects (including nationally significant infrastructure projects, orders under the Transport and Works Act and hybrid bills), where the public benefit would clearly outweigh the loss or deterioration of the relevant habitats*" (at footnote 63 of the NPPF 2026).

3. *This policy applies to development on land inside or outside a designated area, if it would have an impact on the identified biodiversity or geodiversity value of the area concerned*.

National Planning Practice Guidance (NPPG) for the Natural Environment[22]

6.3.11. The NPPG provides context and to the NPPF and advises on how the consideration of biodiversity can inform planning decisions.

Local Context

Adopted Cherwell Local Plan (2011-2031) Part 1[23]

6.3.12. The adopted Local Plan includes the following relevant local policies:

- Policy ESD 9: Protection of the Oxford Meadows SAC
- Policy ESD 10 Protection and Enhancement of Biodiversity and the Natural Environment
- Policy ESD 11 Conservation Target Areas
- Policy ESD 17 Green Infrastructure

6.3.13. A new, emerging updated local plan remains at an early stage in the plan-preparation process and as a result is of limited weight (see the separate Planning Statement for details).

Oxfordshire County Council Tree Policy for Oxfordshire (26/4/2022)

6.3.14. The County Council has a Tree Policy[24] which outlines the County Councils commitment for proactive tree care and tree planting to deliver on the County Councils ambition to increase canopy across Oxfordshire.

6.3.15. Within the Tree Policy for Oxfordshire, there are several policies relating to trees within the county and Oxfordshire County Council will seek to implement these policies where it is the determining authority for planning applications.

[22] Department for Levelling Up, Housing and Communities and Ministry of Housing, Communities and Local Government (2019) National Planning Practice Guidance for the Natural Environment
[23] Cherwell District Council North Oxfordshire 2015. The Cherwell Local Plan 2011 – 2031. Part 1 Adopted 20 July 2015. Page 106.
[24] Available at: https://www.oxfordshire.gov.uk/residents/environment-and-planning/energy-and-climate-change/tree-policy-oxfordshire [Accessed 22/04/2025].

Legislative Framework

6.3.16. Legislation relevant to this assessment includes the following:

- The Conservation of Habitats & Species Regulations (as amended) 2017;
- The EC Birds Directive (Directive 79/409/EEC), as translated into UK law by The Conservation of Habitats and Species Regulations 2017;
- The EC Habitats Directive (Directive 92/43/EEC) as translated into UK law by The Conservation of Habitats and Species Regulations 2017;
- Wildlife and Countryside Act 1981 (as amended) (WCA);
- Natural Environment and Rural Communities Act 2006 (NERC);
- The Environment Act 2021;
- The Protection of Badgers Act 1992, and
- The Hedgerows Regulations 1997.

6.3.17. The Conservation of Habitats & Species Regulation 2017 (as amended)[25] including as amended by the Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019[26] is legislation intended to provide protection for natural habitats and wild flora and fauna of international importance.

6.3.18. The '2019 Regulations' have amended the '2017 Regulations' which transpose the European Council Directive 92/43/EEC of May 1992 on the conservation of natural habitats and of wild fauna and flora (The Habitats Directive) to make them operable since 1 January 2021 when the UK left the European Union. The 2017 Regulations as amended by the 2019 Regulations are hereafter referred to as 'the Regulations'.

6.3.19. Part 2 of the Regulations affords protection to sites of International importance for habitats, or species which rely on these habitats, such as: RAMSAR sites; SACs, and SPAs. Part 3 of the Regulations provides protection for species (plant and animals) as listed on Schedules 2 and 4 that are considered to be of importance. Part 5 of the Regulations provides a

[25] http://www.legislation.gov.uk/uksi/2017/1012/contents/made
[26] https://www.legislation.gov.uk/uksi/2019/579/contents/made

mechanism by which a licence can be obtained for operations that would otherwise be unlawful under the Regulations.

6.3.20. The Wildlife and Countryside Act 1981 (as amended) provides special protection of certain species. Under Part 1 Sections 1(1) and 1(2), all British bird species, their nests, and eggs (excluding some pest and game species) are protected from intentional killing, injury, or damage, Under Sections 1(4) and 1(5), special penalties are applied to bird species included in Schedule 1 of the Act, and protection is extended for these species to disturbance whilst building, in or near a nest and disturbance to dependent young.

6.3.21. Section 9 provides special protection for animal species other than birds that are listed on Schedule 5, and this includes via Section 9(4) protection against damage to "*any structure or place which any wild animal* (*included in the schedule*) *uses for shelter and protection*", and against disturbance whilst in such places. The Countryside and Rights of Way Act 2000 (CRoW Act)[27] amends Section 1(5) of the Wildlife and Countryside Act 1981 by introducing an offence of 'reckless' disturbance to protected wildlife and making certain offences punishable by imprisonment.

6.3.22. Invasive species are covered under Section 14 of the Act, and Section 14(2) makes it illegal to cause to grow in the wild any plant listed in Part II of Schedule 9

6.3.23. Part 2 of the Act provides protection for areas of the countryside recognised for their nature conservation or geological value, including SSSIs and National Parks.

6.3.24. The Natural Environment and Rural Communities Act 2006[28] provides protection for habitats or species that are considered to be of principal importance for the purpose of conserving biodiversity. The legislation requires public authorities, including local planning authorities, to conserve biodiversity when exercising their functions. A list of habitats/species of principal importance, based on the former UK Biodiversity Action Plan (BAP) lists of priority habitats and species, has been produced by the Secretary of State in consultation with Natural England.

6.3.25. The Environment Act 2021 is wide-reaching legislation with the objective to protect the natural environment. Of particular significance to the Proposed

[27] http://www.legislation.gov.uk/ukpga/2000/37/contents
[28] https://www.legislation.gov.uk/ukpga/2006/16/contents

Development are Section 99 and Schedule 15 of the Act which set down the requirement for a minimum of 10% biodiversity net gain to be delivered by Nationally Significant Infrastructure Projects in England in relation to decisions of the Secretary of State. The regulations that have brought these provisions into force were made in May 2026. However, under Government transitional arrangements, the provisions apply in relation to NSIPs that are the subject of an application for a development consent order submitted on or after 2 November 2026. Accordingly, the Proposed Development is not subject to the mandatory biodiversity net gain provisions introduced under the Environment Act 2021.

Other Relevant Nature Conservation Guidance or Initiatives

6.3.26. Red list bird species are those that are globally threatened, whose population or range has declined rapidly in recent years (i.e. by > 50% in 25 years), or which have declined historically and have not recovered. The population status of birds in the UK has been assessed and is compiled in *Birds of Conservation Concern 5*[29].

6.3.27. Leading governmental and non-governmental conservation organisations in England have measured the status of England's flora against standardised IUCN criteria which are assessed and listed in 'A Vascular Plant Red List for England'[30]. Local Oxfordshire field botanists have reviewed the 274 species found to be threatened in Oxfordshire and have produced: 'Oxfordshire's Threatened Plants[31]'.

Non-Statutory Plans & Other Guidance

6.3.28. Other guidance and strategies that have informed the assessment include:

Standing advice from Natural England and Department for Environment Food and Rural Affairs (DEFRA)

6.3.29. This standing advice provides guidance on protected and notable species and includes reference to best practice approaches to survey, mitigation and

[29] Stanbury *et al*., 2021. The status of our bird populations: the fifth Birds of Conservation Concern in the United Kingdom, Channel Islands and the Isle of Man and IUCN Red List assessment of extinction risk for Great Britain. *British Birds* 114:723-747.
[30] Stroh, P. A. Leach, S. J., August, T. A. *et al.* 2014. *A Vascular Plant Red List for England.* Botanical Society of Britain and Ireland, Bristol.
[31] Erskine, S. E., Killick, H.J., Lambrick, C. R and Lee, E. M. 2018. *Oxfordshire's Threatened Plants*. Pisces Publications, Newbury.

compensation[32]. Guidance is also provided on the procedure for obtaining protected species licences.

The Environment Improvement Plan 2023

6.3.30. The Environment Improvement Plan 2023[33] is the first revision of the UK governments 25-year plan and sets out goals legally mandated actions and targets to improve nature in line with international commitments. This has informed the recently released Oxfordshire Local Nature Recovery Strategy (LNRS) that sets out the local priorities for nature recovery and mapped areas identified for the improvement of biodiversity.

Biodiversity and Planning in Oxfordshire

6.3.31. Biodiversity and Planning in Oxfordshire[34] was produced by Berks, Bucks and Oxon Wildlife Trust (BBOWT), Oxfordshire County Council and Thames Valley Environmental Record Centre (TVERC). It highlighted the main biodiversity issues to be considered at the planning stage of any proposals, including Habitats of Principal Importance (HPI) and Species of Principal Importance (SPI) as defined by the NERC Act 2006, and described a number of Conservation Target Areas (CTA) within the county.

6.3.32. CTAs have historically been used in local planning in Oxfordshire to identify areas of priority for biodiversity however were superseded by the Oxfordshire Local Nature Recovery Strategy (LNRS) priority areas published in November 2025[35].

Oxfordshire Local Nature Recovery Strategy

6.3.33. The Oxfordshire LNRS describes and maps numerous habitat enhancement priorities for the county. Priority areas identified are displayed as separate layers within an interactive Local Habitat Map[36], with some locations encompassed within multiple priority opportunity zones.

[32] www.gov.uk [accessed 22/04/25]
[33] DEFRA 2023. Environment Improvement Plan 2023 -First revision of the 25 Year Environment Plan. DEFRA link [accessed 22/04/25].
[34] BBOWT *et al.* 2014. *Biodiversity and Planning in Oxfordshire.* Version 2. March 2014. https://www.wildoxfordshire.org.uk/wp-content/uploads/2018/01/Biodiversityandplanning.pdf [accessed 22/04/25].
[35] https://www.oxfordshire.gov.uk/residents/environment-and-planning/local-nature-recovery-strategy-lnrs [accessed 18.12.25].
[36] https://experience.arcgis.com/experience/ea43e0bc07c044ef8ca4b16803c5e59c?views=View-5 [accessed 18.12.25].

6.3.34. The Application Site coincides with several such zones, including (but not limited to) the following:

- PM05 Create areas of calcareous species-rich grasslands in suitable locations, particularly slopes;
- PM06 Create areas of neutral species-rich grasslands in suitable locations;
- PM09 Create new areas of lowland meadow by creating and restoring meadows in suitable locations (particularly on floodplains);
- PM30 Create new areas of habitat that contain a matrix of habitat types including small woodland patches, scattered trees, scrub, and grassland;
- PM38 Create new woodland by planting trees (or enabling their natural regeneration) using species that are suited to the soil type and site conditions;
- PM42 Restore river diversity and manage rivers and their riparian (riverside) habitats to achieve good ecological condition that supports species;
- PM55 Create new, varied ponds in suitable locations across all habitat types to increase biodiversity and create more clean water habitats;
- PM214 Retain, manage, plant, and connect up blackthorn hedgerows, trees, and scrub for black and brown hairstreak butterflies, and
- PM215 Create or enhance suitable flower-rich grassland habitats with plentiful populations of violets and light patches of scrub for the dark green fritillary *Speyeria aglaja*.

6.3.35. Furthermore, the following SPI are listed within the LNRS Species Priorities List and are considered relevant to the Application Site and adjacent habitats:

- Amphibians: Great crested newt.
- Birds: farmland birds (corn bunting *Emberiza calandra*, grey partridge *Perdix perdix*, lapwing *Vanellus vanellus*, linnet *Linaria cannabina*, skylark *Alauda arvensis*, tree sparrow *Passer montanus*, yellowhammer *Emberiza citrinella*, and yellow wagtail *Motacilla flava flavissima*), curlew *Numenius arquata*, stone curlew *Burhinus oedicnemus*, swift *Apus apus*, house martin *Delichon urbicum*, tawny owl *Strix aluco*, and willow tit *Poecile montanus*.

- Butterflies: brown hairstreak *Thecla betulae*, dark green fritillary, Duke of Burgundy *Hamearis lucina*, small blue *Cupido minimis*, white admiral *Limenitis camilla*, and white-letter hairstreak *Satyrium w-album*;
- Mammals: bats, hazel dormouse *Muscardinus avellanarius*, hedgehog *Erinaceus europaeus*, otter, water vole.
- Plants: meadow clary *Salvia pratensis*;
- Reptiles: common lizard *Zootoca vivipara*.

6.3.36. The above habitats and species are considered within Sections 6.4-6.6 of this chapter and within the supporting Appendices. Particular attention has been paid in this chapter to lowland meadow, calcareous grassland, lowland deciduous woodland, ponds, and hedgerows in terms of HPIs, and to GCN, farmland birds, butterflies, bats, meadow clary and common lizard in terms of SPIs as these are considered the most relevant.

Biodiversity Action Plans

6.3.37. The UK Post-2010 Biodiversity Framework succeeds the UK Biodiversity Action Plan (UK BAP). This framework aims to implement the 1992 Convention on Biological Diversity, to protect rare or declining habitats and species by targeting those identified as being of UK priority, with specific actions to reduce their rarity and decline, and additionally sets out the priorities for UK-level work to support the Convention's Strategic Plan for Biodiversity 2011-2020 and agreed strategic goals and targets. Species and habitats of Principal Importance for the purpose of conserving biodiversity under S41 of the NERC Act (2006) continue to be regarded as conservation priorities under the UK Post-2010 Biodiversity Framework.

6.3.38. In England the focus is on delivering the outcomes set out in the Government's Biodiversity 2020 Strategy which sets out how environment quality will be improved and follows on from policies contained in the Natural Environment White Paper (2011)[37].

6.3.39. Under the Countryside and Rights of Way Act (CRoW) (2000) and the NERC Act (2006) the government and Local Authorities have a duty to extend regard to biodiversity in so far as this is consistent with the proper exercise of their function. At a more local level, the Local BAP (LBAP) targets those

[37] https://www.gov.uk/government/publications/natural-environment-white-paper-implementation-updates [accessed 22/04/25].

species of specific relevance to the county. The Application Site is covered by the Oxfordshire Biodiversity Action Plan and Conservation Target Areas[38] (see Figure 1a of **Appendix ES6.1**).

6.3.40. The following UK and/or LBAP priority species are of potential relevance to the Proposed Development, due to their widespread distribution, existing local records and/or the Application Site's suitability to support these species.

Table 6.8 Species and Habitats of Principle Importance (S41 NERC Act (2006)) and LNRS Priority Species **of Relevant to this Assessment:**

Priority Habitat or Species	S41 NERC Act (2006)	**Oxfordshire LNRS Habitat/Species Priorities List**
Lowland Calcareous Grassland	✓	✓
Neutral Grassland	✓	✓
Lowland Mixed Deciduous Woodland	✓	✓
Hedgerows	✓	✓
Ponds	✓	✓
Arable field margins	✓	✓
Veteran trees	✓	✓
Meadow clary		✓
Badger		
Great crested newt	✓	✓
Common lizard	✓	✓
Grass snake	✓	
Slow worm	✓	
Brown Hare	✓	✓
Water vole	✓	✓
Otter	✓	✓
Hedgehog	✓	✓
Hazel dormouse	✓	✓
Bats	✓	✓
Dark green fritillary		✓
Duke of Burgundy	✓	✓
Brown hairstreak	✓	✓
Small blue	✓	✓
White admiral	✓	✓
White-letter hairstreak	✓	✓
Farmland birds	✓	✓
Stone curlew	✓	✓
Swifts and House martin	✓	✓

[38] https://www.oxfordshire.gov.uk/residents/environment-and-planning/countryside/natural-environment/environmental-policy-and-planning/biodiversity-and-planning [accessed 22/04/25].

Oxfordshire Local Wildlife Sites System

6.3.41. Thames Valley Environmental Records Centre (TVERC) have a key role in maintaining the Local Wildlife Site system in Oxfordshire. Sites are selected by assessment of survey information against a comprehensive set of criteria that form the Berkshire, Buckinghamshire and Oxfordshire Local Wildlife Sites Selection Criteria[39].

6.3.42. Local Wildlife Sites represent 'locally designated sites of importance for biodiversity' as referred to in the NPPF and 'local sites' as referred to in Government Circular 06/2005[40] and they are a material consideration within the planning process.

6.3.43. The published selection criteria provide a useful means to assist with the evaluation of some features, whereby if the selection criteria for a particular feature are met, this would place this as being of county value or importance.

6.4 BASELINE CONDITIONS

Desktop Study

6.4.1. Details of sites of nature conservation interest relevant to the Proposed Development are provided in Appendix ES6.1, including locations shown in Figure 1a.

Sites with a Statutory International Nature Conservation Designation (i.e. Ramsar Sites) and Sites on the National Sites Network (i.e. SPAs and SACs)

6.4.2. One statutory site of **international importance** is present within 15km of the Proposed Development. At its closest point the Oxford Meadows SAC lies c.13.6km to the south-west of the proposed Middleton Stoney Relief Road and c.10.6km southwest of the M40 J9 works. The SAC supports lowland hay meadows (*Alopecurus pratensis*, *Sanguisorba officinalis*), an Annex I habitat for which it is considered to be one of the best examples in the UK.

[39] TVERC, & BMERC. (undated). *Local Wildlife Sites Selection Criteria – Version 7 – Berkshire, Buckinghamshire and Oxfordshire.*
https://www.tverc.org/cms/sites/tverc/files/LWS%20Selection%20Criteria_v7%20Aug18.pdf
[40] Office of the Deputy Prime Minister 2005. Government Circular: Biodiversity and Geological Conservation – statutory obligations and their impact within the planning system. London: The Stationary Office.
https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/7692/147570.pdf

Furthermore, the SAC is the only known outstanding locality for the Annex II species creeping marshwort *Apium repens* (Syn. *Helosciadium repens*).

Sites with a Statutory National Nature Conservation Designation

6.4.3. Ardley Cutting and Quarry Site SSSI was notified for its geological and biological interest and encompasses an area of 40.13ha, part of which lies along the north-eastern boundary of the Main Site adjacent to the Chiltern Main Line railway. The geological interest of this SSSI concerns Jurassic rock exposures whereas the biological interest relates to the presence of limestone (calcareous) grassland, along with scrub, ancient woodland and wetland habitats. Of these SSSI habitats, calcareous grassland, scrub and a seasonal pond coincide with the Application Site, whereas the SSSI ancient woodland is located to the northeastern edge of Ardley Wood, to the opposite side of the rail track to the Proposed Development and over 200m outside the Order Limits.

6.4.4. Ardley Cutting and Quarry Site SSSI also supports fauna interest including butterflies of calcareous grassland such as brown argus *Aricia agestis* and Duke of Burgundy butterfly and a great crested newt population. The parts of the SSSI which lie within the Application Site have been subject to Phase 2 survey, with the type and distribution of habitats mapped, the detailed findings of which are presented in **Appendix ES6.2**.

6.4.5. The Application Site lies within four IRZs of the Ardley Cutting and Quarry SSSI[41] and is of a type and scale that is considered by Natural England, to potentially have an adverse effect on the features for which the SSSI has been notified. The Ardley Cutting and Quarry SSSI is of **National** level importance.

6.4.6. There are no other Biological SSSIs within 2km of the Application Site but there is one Earth Science SSSI (i.e. notified for geology or geomorphology features). A small section (c.0.54ha) of the northern parcel of Ardley Trackways SSSI lies partly within the Application Site at its south-eastern extent. No development is proposed within this area, and its inclusion is solely to enable the installation of newt fencing along its southern boundary and to provide a receptor location for great crested newts captured in the vicinity during licenced pre-works trapping. As this is an Earth Science SSSI (as opposed to having any ecological interest or other relevance to this

[41] https://magic.defra.gov.uk/MagicMap.aspx

assessment of the Proposed Development) it is not considered further within this chapter.

6.4.7. Bestmoor SSSI is located 1.67km from the proposed rail tunnel upgrade works, c.3km from the northwestern habitat enhancement area of the Main Site and over 4km from the closest groundworks associated with the Proposed Development and to the opposite side of the River Cherwell and Oxford Canal. The Impact Risk Zone for this SSSI encompasses the northwesternmost section of the proposed tunnel enhancement works, however works will not impact the habitats above the tunnel and given the intervening distance and lack of habitat connectivity or hydrological linkage no potential impact pathways are identified by which the Proposed Development could impact the favourable status of this site.

6.4.8. There are no other statutory designated sites of national importance within 2km of the Application Site that are designated for their nature conservation value.

6.4.9. Western Fen SSSI is located c.3.8km to the south of the proposed Middleton Stoney Relief Road Highways Works and 2.2km west of the M40 J9 works. Reference to Environment Agency data[42] demonstrates that the Application Site including the J9 works drains to a different catchment to the Western Fen SSSI. It therefore lies outside of the Impact Risk Zone for this SSSI.

Non-Statutory Sites (Figure 1a in Appendix ES6.1)

6.4.10. The desk study identified six LWSs, a single Road Verge Nature Reserve District Wildlife Site (DWS) and three Proposed Cherwell District Wildlife Sites (pDWS) within 1km of the Order Limits boundary.

6.4.11. Upper Heyford Airfield LWS lies adjacent to the western Main Site boundary and supports areas of species-rich calcareous grassland and notable species including bee orchid *Ophrys apifera*, dwarf thistle *Cirsium acaule*, GCN and bird species.

6.4.12. Ardley Fields Quarry LWS is located to the immediate east of Ardley Trackways SSSI and comprises a restored quarry which supports species-rich grassland, young tree planting, ponds and wet ditches. The Application Site includes a narrow strip of land along the southern and eastern boundaries of this LWS. The southern corridor encompasses 0.12ha of the

[42] https://environment.data.gov.uk/catchment-planning/OperationalCatchment/3350

LWS. It is included within the Application Site to enable the installation of newt fencing alongside the adjacent railway embankment habitats. The adjoining narrow corridor along the eastern LWS boundary is included solely because the public right of access is to be removed from an existing footpath located along this edge, therefore no alteration to the existing habitats in this area is proposed.

6.4.13. Ardley Fields Ponds West LWS and Ardley Fields Pond East LWS are located 15m and 670m to the east of the Main Site, on the opposite side of the B430. Both sites support breeding GCN populations.

6.4.14. Stoke Wood LWS comprises woodland, including ancient woodland and more recently established woodland, and is located c.200m east of the proposed Junction 40 improvement works. The extent of the woodland is mostly within the boundary of Tusmore and Shellswell Park CTA.

6.4.15. Trow Pool LWS is located approximately 900m east of the Main Site boundary and comprises two pools heavily vegetated by a good diversity of flora. One pool supports a large population of carp.

6.4.16. Ardley Road Verge Nature Reserve DWS lies mostly adjacent the Main Site to the southeast, but where this extends away from the road verge slightly this coincides with the Main Site (Item 16 in Figure 1a, Appendix ES6.1). The verge and associated grassland support rank grassland, rough calcareous grassland, scrub and hedgerows. The sward is grass dominated but includes species-rich areas with a range of broadleaved herbs, including species typical of unimproved grassland such as field scabious *Knautia arvensis*, greater knapweed *Centaurea scabiosa*, meadow vetchling *Lathyrus pratensis* and lady's bedstraw *Galium verum*. The wider central section of the Ardley Road Verge Nature Reserve supports a population of the rare plant meadow clary.

6.4.17. The Heath pDWS and Trackway adjacent to The Gorse pDWS lie adjacent to the south-western Main Site boundary and extend to between 15m and c.990m east. The Heath pDWS supports mature broadleaved woodland with a ground-flora and the Trackway adjacent to The Gorse pDWS encompasses species-rich hedgerows and adjacent rough grassland. Both support woodland forbs including dog's mecury Mercurialis perennis and spurge laurel *Daphne lureola*. Kennel Copse pDWS is located outwith but immediately adjacent to the western boundary of the Main Site and encompasses two small blocks of ancient semi-natural woodland (ASNW) (Item 22 in Figure 1a, Appendix ES6.1). A small tributary to Padbury Brook

that seasonally runs dry borders the northern boundary of the pDWS. The site is utilised by the North Oxon Field Target Club who maintain the eastern woodland block with minimal ground cover (see photographs in Appendix ES6.1). For this assessment the potential DWSs have been identified as being of County level importance.

6.4.18. Other areas of ASNW in the vicinity of the Application Site include a small block located along the Gagle Brook c.120m south of the Middleton Stoney Relief Road (Item 27 in Figure 1a, Appendix ES6.1), and another at Stoke Wood LWS c.240m east of the proposed route of the Ardley Bypass (Item 7 in Figure 1a, Appendix ES6.1).

6.4.19. Full details of local non-statutory sites are provided within **Appendix ES6.1**.

Conservation Target Area (Figure 1a in Appendix ES6.1)

6.4.20. Whilst the CTAs have been partially superseded by the Oxfordshire LNRS, they continue to operate in tandem with the LNRS to highlight local opportunities for ecological enhancement.

6.4.21. The Main Site and part of the Middleton Stoney Relief Road area are located almost entirely within the Ardley and Heyford CTA. The CTA has a focus on nature enhancement and has five specific targets: i) calcareous grassland, ii) hedgerows, iii) grassland management, iv) great crested newt, and v) geological conservation.

6.4.22. Tusmore and Shellswell Park CTA, noted for areas of established parkland and lowland mixed deciduous woodland including ancient woodland lies c.200m to the east of the Highway Works.

Protected or Notable Fauna

6.4.23. Several records of protected or notable species were identified within the Application Site and neighbouring habitats. These are displayed in Figures 1b to 1e within **Appendix ES6.1** and include at least nine species of bat, four species of amphibian, two species of reptile, six species of butterfly and six other notable invertebrate species, numerous bird records including several Schedule 1 species and Birds of Conservation Concern (Red List), otter, badger, hedgehog, brown hare *Lepus europaeus*, polecat *Mustela putorius* and notable higher plants: including bluebell *Hyacinthoides non-scripta*, meadow clary and Plymouth pear *Pyrus cordata*.

Field Survey

Habitats

6.4.24. Full descriptions of habitats are provided in **Appendix ES6.1** and are shown at Figure 2 within that Appendix**.** The locations of the mature trees are provided in the Arboricultural Assessment (**Appendix ES6.8**: Drawing Reference 01-13).

Ardley Cutting and Quarry SSSI

6.4.25. The IEF of highest ecological value within any part of the Application Site is the on-site section of the Ardley Cutting and Quarry SSSI (see Appendices 6.1 and 6.2).

6.4.26. Habitats present along the banks of the railway cutting and extending into the former quarry area to the south supported areas of open grassland comprising communities of lowland calcareous grassland and lowland meadow, together with significant areas of encroaching mixed scrub and centrally an area of other broadleaved woodland. The SSSI is subject to irregular management, limited to scrub clearance and a mowing regime for the grassland habitats. Areas of scrub that had been cleared shortly prior to the survey in 2022 had grown back and encroached into the adjacent grassland habitats by the time of the updating survey in July 2025, with no evidence of recent management noted during the 2025 survey.

6.4.27. The flatter embankment tops generally supported a tall, unmanaged grassland sward characterised by false oat-grass *Arrhenatherum elatius*, but also featuring a number of calcareous grassland indicators representative of National Vegetation Classification (NVC) community MG1d *Arrhenatherum elatius* grassland: *Pastinaca sativa* subcommunity that typically develops from unmanaged calcareous grassland. Grassland areas with a close correspondence with MG1d and that met the broad habitat definition of lowland meadow were classified as such in accordance with UKHab, rather than as lowland calcareous grassland.

6.4.28. The steeper mid-slopes were characterised generally by a mixture of upright brome *Bromus erectus* dominated grassland, broadly representative of the NVC community CG3 *Bromus erectus* grassland, and an upright brome / tor-grass community representative of NVC community CG5 *Bromus erectus* - *Brachypodium pinnatum* grassland. In a very small number of locations a

short tight sward was present, that had resulted from localised rabbit grazing. These areas supported a high species-richness, with 21-27 species/m^2 noted. The lower slopes of the embankments supported lowland calcareous grassland consistent with NVC community CG4 Tor-grass *Brachypodium pinnatum*.

6.4.29. Encroaching scrub was noted throughout the SSSI area surveyed, as scattered scrub within most grassland communities, and elsewhere as dense stands, the calcareous conditions reflected by the presence of species such as whitebeam *Sorbus anglica*, buckthorn *Rhamnus cathartica* and wayfaring-tree *Viburnum lantana*.

6.4.30. Whilst the scrub and other broadleaved woodland habitats are only of Local level importance the CG3, CG4, CG5 and MG1d grasslands, are grasslands of high botanical nature conservation value with CG3 – CG5 corresponding to 'Lowland Calcareous Grassland' Habitat of Principal Importance, and MG1d corresponding to 'Lowland Meadows' Habitat of Principal Importance[43] and are considered to be of **National** level importance.

Grassland

Main Site

6.4.31. Survey of the Ardley Road Verge Nature Reserve recorded a mosaic of disturbed calcareous grassland, scrub, woodland and hedgerows. A band of secondary woodland formed the western extent of the Nature Reserve and a disused tarmac road also towards the west had been partially colonised by an ephemeral / short perennial community dominated by mosses. An earth bund to the east of the former road supported a mosaic of tall forbs, ephemeral vegetation and developing scrub.

6.4.32. The main area of the Ardley Road Verge Nature Reserve, to the east of the bund and largely located outside of the Application Site comprised a disturbed, heavily rabbit grazed area of herb-rich calcareous grassland with evidence of some recent management to reduce encroaching scrub cover. Species included occasional false oat-grass and tor-grass and frequent to locally frequent perforate St John's-wort *Hypericum perforatum*, greater knapweed, germander speedwell *Veronica chamaedrys*, ox-eye daisy

[43] Jefferson, R.G., Smith, S.L.N., & MacKintosh, E.J. 2019. Guidelines for the Selection of Biological SSSIs Part 2: Detailed Guidelines for Habitats and Species Groups Chapter 3 Lowland Grasslands. Peterborough: Joint Nature Conservation Committee. Available from: https://data.jncc.gov.uk/data/cf50f420-1b38-4253-89f8-1cb7ba010f27/SSSI-Guidelines-3-LowlandGrasslands-2019.pdf [Accessed 20/04/2025].

Leucanthemum vulgare and black horehound *Ballota nigra*. The road verge along the B430 on the eastern boundary supported a tall, unmanaged sward of g3c5 *Arrhenatherum grassland*.

6.4.33. Within the south of the Ardley Road Verge Nature Reserve and outside of the Application Site was a small population of meadow clary, a species listed on Schedule 8 of the WCA, located within two small fenced-off areas. The Ardley Road Verge Nature Reserve was considered to still meet relevant selection criteria and is of **County** level importance.

6.4.34. The majority of the remaining areas of grassland within the Main Site comprised modified and species-poor neutral grassland field compartments. These habitats support limited botanical diversity and are common / widespread locally, often with regular management or disturbance and no associated notable species. Therefore, they were identified as being of no more than **Site** level importance.

6.4.35. Smaller areas of neutral grassland were associated with road verges including the western road verge of the B430 adjacent to hedgerows H61 and H62. These areas are more botanically diverse than neighbouring areas of grassland, though are not sufficiently diverse to meet LWS criteria. They are considered to be of no more than **Local** level importance.

Highway Works

6.4.36. Areas of modified grassland and generally species-poor neutral grassland are located along the road verges associated with Junction 10 and the M40 that will be affected by the Highway Works. Some areas include a reasonable diversity of forbs that are typical of neutral grasslands and some species commonly recorded in calcareous conditions, influenced by the underling lime-rich soils. Small numbers of pyramidal orchid *Anacamptis pyramidalis* were recorded within the verge to the west of Baynards Green roundabout and grassland surrounding the attenuation ponds. None of the plant communities associated with these verges are considered to be of sufficient diversity to qualify as a Habitat of Principle Importance, BAP Priority Habitat or LWS habitat, and it is likely that similar communities are also associated with the road verges in the surrounding area. Such habitats are considered to be of no more than **Local** level importance.

6.4.37. A compartment of unmanaged species-poor neutral grassland lies south of the railway line within the Valencia Waste Management Facility. Here the sward was dominated by false-oat grass with occasional ruderal species

distributed throughout. To the north of the railway line the sward was botanically more diverse and included crested dog's-tail *Cynosurus cristatus*, red fescue *Festuca rubra* agg., wild carrot *Daucus carota*, bird's-foot trefoil *Lotus corniculatus*, common knapweed, common mouse-ear *Cerastium fontanum*, yarrow *Achillea millefolium* and creeping cinquefoil *Potentilla reptans*. Shorter sward grassland to the south of the railway boundary fence included occasional and rarely recorded black medic *Medicago lupulina*, creeping cinquefoil, mouse-ear hawkweed *Hieracium pilosella*, red clover *Trifolium pratense* and bee orchid. Areas of unmanaged rough grassland including to the east of the M40 were generally dominated by false oat-grass with encroaching bramble and other scrub species.

6.4.38. In similarity to many of the patches of neutral grassland within the Application Site there is an indication of a calcareous influence; marked here by the presence of occasional wild parsnip *Pastinaca sativa* and woolly thistle *Cirsium eriophorum*. These grassland areas were not however considered to be sufficiently diverse to meet the LWS selection guidelines and therefore are considered to be of no more than **Local** level importance.

6.4.39. A field compartment of neutral grassland located to the south of the Middleton Stoney Relief Road route and extending beyond it is managed for silage and is known to have been created at least 15 years ago as part of a Higher Level Stewardship scheme. The management has since been relaxed, and the sward supports a number of ruderal species and is dominated by a small number of herb species. Given its overall botanical diversity is however considered to be of **Local** level importance.

6.4.40. Sections of the existing road network will be impacted by the Proposed Development, including for example works within areas of hard standing and sealed surfaces to enable the installation of a foul drainage connection within Bicester. Such works are likely to directly impact only the existing highway and immediate environs, i.e. adjacent grass verge edges and managed habitats on roundabouts. Given the nature and location of such habitats these are considered to have Negligible nature conservation importance.

Arable Land

6.4.41. Arable land forms the main component of the Main Site and several parts of the Highway Works areas. Arable compartments by their very nature support little semi-natural vegetation and have limited floral diversity. These compartments were generally large with botanical interest restricted to field margins. Arable field margins were generally c.1-2m wide but with some c.5-

6m sections and were generally subject to a late summer/autumn cut and were dominated by ruderal herbs and coarse grasses. Occasional arable weeds recorded encroaching into arable crops from the field margins included common field speedwell *Veronica persica*, black-grass *Alopecurus myosuroides*, and shepherd's purse *Capsella bursa-pastoris*.

6.4.42. Three fields located within the south of the Application Site (fields G108, G109 and G110) were left fallow throughout the 2025 growing season and at the time of survey in July 2025 were becoming colonised by grassland species and herbaceous arable weeds.

6.4.43. Arable field margins are a priority habitat type as listed on S41 of the NERC Act 2006 and LBAP priority habitat. The field margins surrounding the arable land do not however provide a mixture of tussocky and fine-leaved grasses which provide a representative example of this habitat. Consequently, the arable land and the associated margins are identified as being of no more than **Site** level importance.

Tall Forb Vegetation

6.4.44. This habitat bordered most grasslands, waterbodies, watercourses, ditches and hedgerows with the occasional larger patches present where habitats were generally less managed. Abundant and frequent species include willowherb *Epilobium* sp., common nettle *Urtica dioica*, hogweed *Heracleum sphondylium*, wild teasel *Dipsacus fullonum*, bristly ox-tongue *Helminthotheca echioides*, creeping thistle *Cirsium arvense* and cow parsley *Anthriscus sylvestris*. These habitats were of low diversity and have **Negligible** nature conservation importance.

Scrub

6.4.45. Scattered and dense scrub habitats were recorded in areas of the Main Site. Scattered scrub was largely present at the site boundaries and included species such as dog-rose *Rosa canina* agg., hawthorn *Crataegus monogyna*, bramble *Rubus fruticosus* agg. and elder *Sambucus nigra*. Areas of dense scrub were dominated by bramble, along with species such as hawthorn, wild cherry *Prunus avium* and elder.

6.4.46. Areas of dense scrub were also recorded at the peripheries of fields north of the railway line and within more formerly planted areas within the Highway Works area and included species such as hawthorn, hazel *Corylus avellana*, dogwood *Cornus sanguinea* and blackthorn *Prunus spinosa*.

6.4.47. From a botanical perspective these habitats are assessed as being of no more than **Site** level importance.

Plantation Woodland

Main Site

6.4.48. Plantation woodland forms the main woodland type within this part of the Application Site (located on the site boundary with the B430 and within the body of the Main Site), the majority of which is categorised as mature. Whilst this is mostly comprised of broadleaf species it includes a conifer stand and an area of mixed plantation. Typical of this habitat type and age of woodland, the canopy is even-aged and largely arranged in single species blocks, reflecting the planting scheme, the understory is often lacking or poorly defined, deadwood is lacking, and the field-layer is relatively species-poor with few woodland indicator species. As such, these woodlands do not represent Lowland Mixed Deciduous Woodland HPI and is of **Local** level importance.

Highway Works

6.4.49. Several groups of trees formed by early-mature and mature trees located on verges. create a buffer between the existing highway and farmland in the north of the Highway Works area. Formal planted groups situated on roundabouts often had dense scrappy forms.

6.4.50. Small plantation woodland blocks were also located at the edges of arable fields.

6.4.51. All areas were mostly homogenous but mature or maturing, contributing to the structural diversity of habitat within this area and provide shelter and foraging opportunities for a range of fauna. As such, plantation woodland habitats within this area are considered to be of **Local** level importance.

Arboriculture

6.4.52. A total of 266 individual trees, 139 groups of trees and five woodlands, are present within or closely adjacent to the Application Site (Arboricultural Report Appendix ES6.8) (counts per category are derived using arboricultural classifications and therefore differ slightly from those used for ecological/BNG purposes). The majority of trees are associated with

hedgerows and are in variable condition as is typical of trees associated with farmland. Evidence of the following was noted: browsing damage, storm damage, pruned lower branches to provide clearance for machinery, and the cultivation of fields close to tree stems.

6.4.53. The majority of the individual trees (226), woodlands (4) and groups of trees (136) were recorded as being of within Categories B and C of the category's definition set out in Chapter 4 of BS5837. 26 individual trees, one tree group and one woodland were recorded as being of high arboricultural quality and within Category A.

6.4.54. Although the mature trees do add to the structural diversity of the habitats with which they are associated, in their own right they represent a common and widespread habitat and are of no more than **Site** level importance.

6.4.55. Three veteran trees (based on the definition of a veteran tree provided within the NNPS) were identified within the Application Site (trees T93, T150, and T152 within Appendix ES6.8), and a fourth such tree located outside of the Application Site boundary but within influencing distance (tree T170). Veteran trees have **National** level importance.

6.4.56. No ancient woodland is present within the Application Site. An ancient woodland stand is located directly adjacent the Order Limits to the northwest of the Main Site (Kennel Copse) however this lies c.300m from the closest section of proposed development and will be buffered by significant green infrastructure. Burntwood Copse lies c.50m from the proposed route of the Middleton Stoney highway at its closest point and will be buffered by a broad green infrastructure corridor including extensive lowland mixed deciduous woodland planting. No likely significant direct or indirect impacts to ancient woodland are identified.

6.4.57. No trees subject to a Tree Preservation Order (TPO) have been identified within the Application Site. The RAF Upper Heyford Conservation Area however abuts the northwestern boundary of the 'Main Site'. Under the Planning (Listed Buildings and Conservation Areas) Act 1990, a Conservation Area designation provides protection to trees with extra planning controls in place to help the local planning authority manage change in conservation areas so that the special interest can be preserved.

<u>Semi-Natural Woodland</u>

6.4.58. There are no areas of ASNW or plantations on ancient woodland sites (PAWS) present within the Order Limits, and no semi-natural (non-plantation) woodland present within the Main Site.

Highway Works

6.4.59. The key area for this habitat type is an area of riparian woodland along the Gagle Brook which runs through the Middleton Stoney Relief Road area. Canopy species comprise frequent ash with occasional sycamore, hybrid crack willow *Salix x fragilis* and horse-chestnut *Aesculus hippocastanum,* and more rarely hybrid black poplar *Populus* x *canadensis* and beech *Fagus sylvatica*, with a species-poor ground flora. Established common ivy *Hedera helix* cover was present and the arboricultural survey recorded evidence of ash dieback caused by *Hymenoscyphus fraxineus* and horse chestnut leaf miner *Cameraria ohridella*. This area is considered to have **Local** level importance for nature conservation.

6.4.60. A narrow corridor of lowland mixed deciduous woodland borders the B4030 to the south. This is dominated by ash and sycamore with less frequent common lime *Tilia x cordata* and field maple *Acer campestre* and with a sparse understorey largely comprising hawthorn.

6.4.61. The western edge of Sycamore Grove Wood lies within the proposed M40 J10 Highway Works area adjacent to the Cherwell roundabout. Regeneration was noted throughout, with scattered ash and sycamore seedlings and ground flora included locally frequent patches of dog's-mercury. This woodland is mapped as Lowland Mixed Deciduous Woodland Priority Habitat and provides connectivity to the offsite area of ancient woodland within Stoke Wood LWS. Therefore, this woodland is considered to be of **County** level importance.

Hedgerows

Main Site

6.4.62. There are a total of 58 hedgerows within or partially within the area of the Main Site, the majority of which are species poor, averaging four or fewer woody species per average 30m section of hedgerow, with the exception of hedgerows H3, H6, H40, H65, H86, H87, H89, H96, H97 and H98 which support on average five or more species per 30m. All hedgerows within the Main Site consist entirely of native species and therefore qualify as a Habitat of Principal Importance and as Priority Habitat of the Oxfordshire BAP. A

single hedgerow H65 was assessed as being 'Important' according to the wildlife and landscape criteria of the Hedgerow Regulations 1997 and is considered to be of **County** level importance[44]. None of the hedgerows within the survey area are of sufficient species or structural diversity to qualify as LWS habitat and as an overall resource are considered to be of **Local** level importance.

Highway Works

6.4.63. A total of 43 hedgerows are located within or partially within the combined Highway Works Areas. All consist entirely of native species and therefore qualify as a Habitat of Principal Importance and as Priority Habitat of the Oxfordshire BAP. Furthermore, hedgerows H44, H48, H50, H54, H56, H70, H82, H92, H93, H103, H105, H106, H107 and H108 are considered to be species rich. Hedgerows H48, H50, H90, H106 and H108 are located adjacent to public rights of way, have few gaps, good connectivity and/or a number of mature trees along their length, hence are assessed as being 'Important' according to the wildlife and landscape criteria of the Hedgerow Regulations 1997. Given the hedgerow resource present and available contextual information, it is considered appropriate to classify these six hedgerows as being of **County** level importance. All of the remaining native hedgerows, including those of comparatively low diversity and poor structure, are considered to be of **Local** level importance.

Watercourses

Main Site

6.4.64. Padbury Brook Tributary flows in an easterly direction through the north-western field compartment of the Main Site. The channel is narrow, c.0.5-1.0m width with some sections extending to c.3m with a silty substrate. The water depth was less than 10cm with a slow flow in June 2025 and had dried completely by July. Emergent vegetation included locally dominant water parsnip *Sium latifolium*. Banks are generally between 0.5-1m high with hedgerows H40 and H88 bordering the northern and southern bank tops and a small block of ancient woodland borders the northern bank top at the western extent.

6.4.65. Ashgrove Brook bisects the Main Site from north to south and two ditches located towards the Heyford Park site (ditch D1 along hedgerow H5 and a

[44] Any 'historic' hedgerows are considered under the Heritage & Archaeology Chapter 10.

wet ditch along H16 feed into this brook (see Figures 2c and 2e within Appendix ES6.1). The main brook channel in July 2025 was c.1m wide and shallow (c.20cm depth) with a silty substrate and generally slow flow, however most of the watercourse north of Camp Road was dry. The banks varied along the length of the brook from shallow and heavily poached to approximately 0.5m high and over 45°. Overall emergent vegetation was sparse, limited to locally occasional patches of fool's watercress *Helosciadium nodiflorum* and great willowherb *Epilobium hirsutum*. The banks supported a mixture of vegetation including species-poor neutral grassland, tall forb vegetation and plantation woodland, with much of the brook channel also bordered by a combination of hedgerows and tree/ woodland cover.

6.4.66. The above watercourse sections provide some habitat diversity within the area and overall are recognised as being of **Local** level importance.

Highway Works

6.4.67. The Padbury Brook flows eastwards through the J10 Highway Improvement Works where it is culverted beneath the A43 and M40. The section of the channel between the culverts is heavily reinforced with concrete along both bank faces and the channel bed. The channel section to the west of the M40 the brook is naturalised, approximately 3m wide with a primarily silt and pebble substrate and with no discernible flow and with steep banks to c.1.5m height. The water levels were 5-10cm depth at the time of survey in June 2025 with abundant lesser duckweed *Lemna minor* indicative of eutrophic conditions.

6.4.68. Despite the level of modification, Padbury Brook provides some connectivity beneath the road network into the wider landscape and is recognised as being of **Site** level importance.

6.4.69. The Gagle Brook flows south through the proposed Middleton Stoney Relief Road Highway Works Area. The gentle sloping banks are between 0.5-1m width and both bank tops support riparian trees and mature scrub. The channel is approximately 2m wide with a slow flow in spring and mid-summer of 10-20cm depth but was recorded as largely dry in August 2025. The substrate is primarily comprised of earth with some organic matter in the form of leaf debris. Aquatic/marginal vegetation was limited to occasional stands of fool's watercress in areas where there was less canopy shading. Some areas of the adjacent woodland were cleared between the May and August

2025; in these areas the bankside vegetation was sparse and/or covered with tree debris.

6.4.70. Due to the association and connectivity to valuable habitats including woodland and Trow Pool which lies upstream, as well as its broader value as a water source and a connective corridor, this section of the Gagle Brook is considered have of **County** level importance to nature conservation.

6.4.71. All watercourse sections within the Application Site with the exception of the highly modified section of Padbury Brook that crosses J10 of the M40 are minor tributaries within the upper reaches of Padbury Brook and Ashgrove/ Gagle Brook and dry out regularly (recorded dry during each summer of the extended survey period).

Static Waterbodies

Main Site

6.4.72. Five waterbodies occur within the Main Site, comprising three ponds, a double concrete water tank and a disused swimming pool. Of these onsite ponds GCN were absent from all but the double concrete water tank, in which a single GCN was recorded during surveys in 2025. None of the waterbodies otherwise supported notable flora or fauna and together these have a very limited contribution to the wetland resource and biodiversity value of the site. Pond P4 is considered to have **Local** level importance and the other on-site waterbodies no more than **Site** level importance. Several waterbodies comprising a combination of ponds and water tanks lie in close vicinity to the Main Site within the disused RAF Upper Heyford airfield to the west and the Viridor ERF site to the east.

Highway Works

6.4.73. Two additional ponds occur within the Highway Works Areas: P20 and P50. P50 is an attenuation basin surrounded by Junction 10 of the M40 and supports stands of abundant common reed *Phragmites australis* and locally frequent yellow flag iris *Iris pseudacorus*. The banks supported neutral grassland with stands of scrub and trees at the top of the banks and all were isolated by the road network associated with the motorway and junction. A second attenuation feature adjacent to the south (P51) is surrounded by but excluded from the Application Site. GCN were recorded present within both P50 and P51 during surveys completed in 2022, however the species was recorded absent from P50 in 2025.

6.4.74. P20 is located within the Ardley Cutting SSSI within the northern Highway Works Area (Appendix ES6.1 Figure 2d). It held shallow water at times through the year but was noted to be dry for much of the 2022 and 2025 spring and summer seasons.

6.4.75. Despite its function as a drainage feature P50 offers a resource to local fauna, including small number of great crested newts resident in the close vicinity and is hence identified as being of **Local** level importance due to the presence of the newt population. P20 is considered to have no more than **Site** level ecological importance.

Notable plants

6.4.76. The desk study identified a small number of notable plant species records from within 1km of the Application Site and from within the past 20 years (see Figure 1e within Appendix ES6.1), these being primarily concentrated in three locations: i) Ardley Road Verge Nature Reserve in the south of the Main Site, ii) adjacent to the Ardley Cutting and Tracks SSSI to the north of the Main Site, and iii) Stoke Wood LWS to the north-east. Records for five species: meadow clary, night-flowering catchfly *Silene noctiflora*, bloody crane's-bill *Geranium sanguineum*, field scabious, and many-leaved sedge *Carex divulsa* subsp. *Leersii* were returned from within or closely adjacent to the Application Site boundary.

6.4.77. Meadow clary is listed on Schedule 8 of the Wildlife and Countryside Act 1981 (as amended) and is therefore protected from intentional picking, uprooting or destruction[45] and is classified as Near Threatened on the Vascular Plant Red List for England[46] and overall is a nationally scares species. A small population of Local importance was recorded within Ardley Road Verge Nature Reserve within two small fenced-off areas adjacent to the B430 however this population was located outside of the Application Site.

6.4.78. Field scabious was also recorded within the Ardley Road Verge Nature Reserve designation in low abundance is similarly categorized as Near Threatened but is not listed on the local rare plan register and generally is a

[45] https://www.legislation.gov.uk/ukpga/1981/69/schedule/8
[46] Stroh, P. A. Leach, S. J., August, T. A. *et al.* 2014. *A Vascular Plant Red List for England.* Botanical Society of Britain and Ireland, Bristol.

more widespread species. This species is therefore considered to be of **Site** level importance.

6.4.79. Basil thyme *Clinopodium acinos* was recorded present within the most easterly extent of the Application Site close to the M40 rail bridge in 2022 (but not in 2025). Basil thyme has previously been recorded present within Ardley Wood (TVERC record from 2021) and elsewhere within the SSSI (in the 1980s). It is a species of principal importance, has a conservation status of vulnerable and is an Oxfordshire Rare Plant[47]. The recorded population is therefore considered to be of **County** level importance.

6.4.80. Night flowering catchfly and many-leaved sedge are classified as Scarce within Oxfordshire[47]. The single record returned for night-flowering catchfly was dated 2011 and was recorded along the verge of the B430, and the single record for many-leaved sedge was dated 2018 and was located further south along the same road verge towards the south of the Main Site. These two species were not recorded during the ecological surveys and are therefore not considered to be extant and are not considered further in this assessment.

Other Habitats

6.4.81. Other habitats present within the Application Site included a small area of amenity grassland within a small area of public open space at the Ardley Road/B430 junction. This habitat is considered to be of **Site** value. Extensive areas of tarmac and concrete hardstanding and buildings have **negligible** ecological value.

Fauna

6.4.82. The following section summarises and evaluates the ecological importance of fauna within the Application Site. Further detail is provided in **Appendix ES.6.1** and **Appendices ES.6.3 to 6.7**.

Badger

6.4.83. The full results of the assessment of the badger survey are confidential and will be submitted to the Inspectorate under a separate cover. In brief, site surveys have confirmed that badgers make use of the Main Site and the

[47] Erskine, S. E., Killick, H.J., Lambrick, C. R and Lee, E. M. 2018. *Oxfordshire's Threatened Plants*. Pisces Publications, Newbury.

Highways Works Areas and the surrounding habitats. Badgers are common and widespread, and not a priority species, and would not be considered to be of local value, but are afforded specific protection against ill-treatment and disturbance, with the potential for that legislation to be breached. Consequently, the recorded badger population is considered an 'important feature' within this assessment, and considered to be of **Local** value, but only in terms of legislation.

Bats

6.4.84. Full details of the bat survey work undertaken are provided in **Appendix ES6.3.**

Roosts – Buildings

6.4.85. Bats and their roosts are afforded legal protection at a UK and EU level. Of the twelve buildings/built structures present within the Application Site buildings/sections B1e, B1f, B2a and B3a, B3d and B11 were categorized as having low potential to support roosting bats; buildings B1b, B1c, B3e and B3f as having moderate roost potential, and B1a, B1d, B5 and B10 as high potential to support roosting bats or confirmed roost sites, based on the nature of potential access and roost features and of any evidence recorded. All other buildings/sections are considered to provide negligible potential to be used as a bat roost and are not considered further in this assessment.

6.4.86. Nocturnal surveys subsequently recorded a small number of individual common pipistrelle *Pipistrellus pipistrellus* (range 1 to 4) returning to roost within buildings sections B1a and B1d within Ashgrove Farm on four occasions, and similar numbers of common pipistrelles (range 1 to 3) emerging from or returning to roost within the Ashgrove Cottages (building B1) on two occasions. A single common pipistrelle was recorded emerging from building B5 on one occasion and a single brown long-eared bat was observed within the structure during a building inspection. Common pipistrelle and brown long-eared bat are common and widespread species and the presence of small non-maternity roosts of such species within buildings associated with Ashgrove Farm is considered to be of **Local** level importance.

Roosts – Trees with Potential Roost Features (*PRFs*)

6.4.87. [redacted]

6.4.88. No trees with a confirmed bat roost are located within the Proposed Development Area. If confirmed present by the pre-works checks the presence of a bat roost is likely to be of at least **Local** level importance for local bat populations.

Bat Foraging and Commuting

6.4.89. Surveys confirmed that the following bat species utilize habitats within the Application Site: common pipistrelle, soprano pipistrelle *Pipistrellus pygmaeus*, brown long-eared bat *Plecotus auritus*, noctule *Nyctalus noctula*, Nathusius' pipistrelle, barbastelle, Leisler's bat *Nyctalus leisleri* and serotine *Eptesicus serotinus*, along with unidentified *Pipistrellus*, *Myotis*, and *Nyctalus* species. Barbastelle, brown long-eared bat, noctule and soprano pipistrelle are Species of Principal Importance in accordance with Section 41 of the NERC Act (2006). Barbastelle is an Annex II species as listed on the Habitats Directive.

6.4.90. Within the Main Site bat activity was largely associated with field boundary hedgerows and treelines and with the central narrow woodland corridor alongside Ashgrove Brook. Bat activity levels along a connecting treeline between the brook corridor and the B430, and also alongside The Heath pDWL to the west were also consistently relatively high. Within the northeastern Highway Works Area bat activity was consistently high around the two attenuation basins surrounded by the M40 J10, and to a lesser extent along hedgerows linking east-west between the B430 and M40. Bat activity within the southern Highway Works Area was mainly associated with the tree belt along Gagle Brook.

6.4.91. Overall bat activity was mostly associated with field perimeter hedgerows / treelines, watercourses, attenuation basins and woodland / plantation edge

[48] A tree with one or more potential roost feature (PRF) suitable to support multiple bats and may therefore be used by a maternity colony.
[49] A tree with one or more PRF suitable for no more than very small numbers of bats, either due to size or lack of suitable surrounding habitats.

habitats, with no significant post-dusk and pre-dawn peaks in activity noted indicative of important commuting routes to neighbouring roost sites.

6.4.92. Barbastelle activity accounted for c.2.4% of the total activity recorded by the static detector surveys to date, with this species recorded present at all 25 static detector locations throughout the Application Site. Across April-July inclusive cumulative barbastelle activity within the Main Site was largely associated with Ashgrove Brook and with the tributary of Padbury Brook to the northwest, whereas within the southern Highway Works area barbastelle activity was associated with the Gagle Brook corridor, though with variability apparent in activity levels month to month. Barbastelle was generally recorded in low numbers within the northeastern Highway Works Area.

6.4.93. No peaks in barbastelle activity were noted during key commuting periods post sunset and pre sunrise (April-July surveys) (see Appendix ES6.3), and a trapping exercise that targeted potential barbastelle commuting routes recorded only male barbastelle. As such no evidence was noted to suggest the presence of a barbastelle maternity roost in the vicinity of the Application Site, or that habitats present within the Application Site lie within the core sustenance zone of such a roost. Based upon the timing and frequency of barbastelle activity recorded, on-site habitats likely form a relatively small proportion of larger home ranges, with features such as the brook corridors used by small numbers of bats, both as a foraging resource and as a means to access other parts of individual home ranges.

6.4.94. Nathusius' pipistrelle, serotine and Leisler's bat were recorded only very occasionally within the Application Site (18, 32 and 12 registrations each via the static detector survey to date). Nathusius' pipistrelle is considered widespread but rare within Oxfordshire, and serotine and Leisler's bat as widespread but infrequently occurring.

6.4.95. The bat species assemblage described by the field data and the relative frequency of activity detected for each species in the surveys undertaken is considered typical of the habitat composition of the Application Site and its geographic context. The Application Site is therefore considered to represent a roosting/foraging/ commuting resource of **Local** level importance for each of the individual bat species present.

Great Crested Newts

6.4.96. Full details of the below surveys and resulting field data are provided in **Appendix ES6.4**.

6.4.97. The desk study revealed populations of great crested newts located to the east of the Application Site (east of the B430) within a series of natural and artificially created mitigation ponds, and a population to the west within the disused Upper Heyford Airfield RAF base, which is centred on a series of water tanks.

6.4.98. Seven waterbodies were present within the Application Site and a further 81 waterbodies occurred within 500m, some seasonal or fully succeeded to dry habitats. Presence/absence aquatic surveys were undertaken of the on-site waterbodies and accessible waterbodies within 500m in spring 2025. Exceptions were a single pond that could not be adequately accessed safely via presence/absence surveys that was instead subject to eDNA sampling, and waterbodies present within the neighbouring Upper Heyford former airfield and associated land, that were instead subject to survey by a third party as part of surveys undertaken in 2025 in support of a neighbouring application.

6.4.99. The aquatic surveys of the seven waterbodies within the Application Site recorded a single adult GCN on one survey occasion (within P4, a double concrete water tank towards the northwest of the Main Site). This species was not otherwise recorded present within the Application Site.

6.4.100. Survey data from the off-site waterbodies demonstrated that the Application Site is located between four separate and largely off-site GCN meta populations with P4 forming part of Metapopulation 1 centred within the airfield to the west. The on-site waterbody P50 is located within the M40 J10 Highway Works Area and is encompassed by the range of Metapopulation 4 to the northeast.

6.4.101. Metapopulation 1 centred primarily across the Upper Heyford former airfield, and Metapopulation 3 located within the Ardley Bypass and eastern rail track connection area each support large (>100) GCN metapopulations, whereas Metapopulation 2 located to the east of the Application Site and Metapopulation 4 centred on the M40 J10 and associated northern Highway Works Area each support a medium sized GCN metapopulation (11-100).

6.4.102. Given the agricultural nature of most habitats within the Application Site and scarcity of suitable breeding habitat, it provides limited commuting opportunities for the dispersal of GCN between these metapopulations.

6.4.103. The GCN metapopulations primarily based within off-site habitats surrounding the Application Site have been identified as being of **County** level importance as these meet the LWS selection guidelines.

Reptiles

6.4.104. The arable land and open grazed grassland fields that dominate the Application Site are characterised by largely homogenous and intensively managed habitat that is suboptimal for use by native reptile species. The unmanaged grassland road verges, including those of the M40, provide some potential opportunities for reptiles to forage and shelter. This habitat is both limited in overall extent and is isolated from any other significant areas of suitable habitat; and is therefore considered to be suboptimal for reptiles. Given the poor quality and/or fragmented nature of habitats within the Highway Works areas it is considered likely that reptiles are absent from these areas.

6.4.105. Targeted reptile surveys undertaken within the Application Site in 2025 and previously in July-September 2021 recorded 'good' populations of grass snake *Natrix helvetica* and common lizard and a 'low' population of slow worm *Anguis fragilis* (population categories in accordance with HGBI 1998[50]). Reptiles were primarily recorded along hedgerows and associated field margins, particularly those between Ashgrove Farm and the rail track, adjacent to the airfield, and one grass snake along Gagle Brook. Common lizard, grass snake and slow worm are Species of Principal Importance that are widespread. The recorded reptile assemblage meets the criterion for a 'good reptile assemblage' within the 'Local Wildlife Sites Selection Criteria' on the basis of grass snake and common lizard numbers recorded, and is therefore considered to be of **Local** level importance.

6.4.106. Grassland and scrub cover alongside the adjacent railway track embankments provides further suitable habitat for reptiles and forms part of a more extensive area that extends far beyond the boundary of the Application Site. These habitats display a diversity of vegetation structure, creating potentially suitable areas for reptiles to bask, forage and shelter. The railway embankments remain inaccessible to direct survey therefore the presence/absence of reptiles within these habitats has not been determined.

[50] Herpetofauna Groups of Britain and Ireland (HGBI) 1998. *Evaluating local mitigation/translocation programmes: maintaining best practice and lawful standards*. HGBI advisory notes for amphibian and reptile groups. HGBI c/o Froglife, Halesworth. (Unpublished).

Birds

6.4.107. Full details of the below surveys and resulting field data are provided in **Appendix ES6.5**.

Breeding Birds

6.4.108. A series of six breeding bird surveys was undertaken across the Application Site and areas of adjacent habitat in 2025 (see Figure 2 of Appendix ES6.5). This comprised dawn survey visits completed in March, April, May, June, and early July, and a single dusk survey in early June 2025. Three surveys were undertaken in 2026 of two additional arable fields to the northwest of the Main Site that are proposed for ecological compensation to establish their ornithological baseline (Figure 4 of Appendix ES6.5).

6.4.109. The 2025 surveys recorded a total of 80 bird species within the survey area (encompassing the Application Site and some additional adjacent habitats), of which nine species were recorded overflying the survey area only and therefore were considered to be non-breeders within the Application Site and hence unlikely to be impacted by the Proposed Development. Of the remaining 71 species, 41 are considered notable due to their inclusion within Schedule 1 of the WCA; British Trust for Ornithology's Birds of Conservation Concern (BoCC) Red or Amber lists; Section 41 of the NERC Act 2006; and/or the Oxfordshire Local Biodiversity Action Plan.

6.4.110. Arable fields and associated field margins supported a relatively limited assemblage of breeding birds, but one that included notable and declining farmland species of national conservation priority (NERC Act 2006): grey partridge *Perdix perdix*, skylark, yellow wagtail, linnet, corn bunting, yellowhammer, and reed bunting *Emberiza schoeniclus*. Numbers of the above were typically low given the size of the survey area, though more significant populations of skylark and yellowhammer were present. Fallow fields additionally supported large transient flocks of notable woodpigeon *Columba palumbus* and mixed flocks of foraging and loafing gulls. Although the farmland bird species recorded have undergone national declines, overall, they are considered widespread within the local area.

6.4.111. The 2026 surveys recorded a similar bird species assemblage within the two arable fields and their associated narrow margins, including several species predominantly associated with farmland (and for which this land is proposed to be enhanced), namely grey partridge, skylark, yellow wagtail, linnet, and yellowhammer. Priority species occurred in relatively low numbers for the

extent of habitat present, but with a more significant population of skylark present than in neighbouring compartments within the Main Site under comparable arable management. These fields were primarily used as a foraging resource by common and widespread generalist bird species but including notable species such as woodpigeon, red kite *Milvus milvus*, sparrowhawk *Accipter nisus*, swift and house martin.

6.4.112. Overall the skylark and yellowhammer breeding populations are considered to be of County-level significance, and from those of the wider farmland bird assemblage including grey partridge, linnet, corn bunting, and reed bunting populations is considered to be of **Local** level importance.

6.4.113. Hedgerows and scrub supported typical farmland species including yellowhammer, linnet, yellowhammer, meadow pipit *Anthus pratensis* and small numbers of reed bunting, with denser scrub thickets along the railway embankments supporting additional species such as willow warbler *Phylloscopus trochilus* and bullfinch *Pyrrhula pyrrhula*. Grazed grassland fields were used by foraging rooks *Corvus frugilegus* and by smaller numbers of woodpigeon, gulls, passage wheatear *Oenanthe oenanthea* and occasional redwing *Turdus iliacus* and fieldfare *Turdus pilaris* flocks whereas areas of rougher grassland supported skylark. Mature tree standard supported single breeding pairs of barn owl *Tyto alba* and kestrel *Falco tinnunculus*, and the woodland bordering Gagle Brook supported breeding tawny owl *Strix aluco*. Farm buildings and gardens supported house sparrow *Passer domesticus* and dunnock *Prunella modularis*. The breeding bird assemblage associated with hedgerow, tree and woodland habitats is considered to be of **Local** level importance.

Wintering Birds

6.4.114. A series of four wintering bird surveys was undertaken across the Application Site and areas of adjacent habitat, once per month between November 2024 and February 2025 inclusive, with surveys timed between dawn and early afternoon.

6.4.115. These recorded a total 74 bird species within the survey area (see Figure 3 of Appendix ES6.5), of which three species were only recorded overflying the survey area and therefore were not considered to be using the Application Site. Of the remaining 71 species, 36 are considered notable.

6.4.116. The wintering bird species assemblages recorded were largely typical of the agricultural habitats present across the survey area, with stubble fields

supporting foraging skylark and large mixed flocks of woodpigeon and stock dove, in addition to transient groups of starling *Sturnus vulgaris* and winter thrushes, rooks, meadow pipit, snipe *Gallinago gallinago*, mistle thrush *Turdus viscivorus*, and yellowhammer. A large field compartment south of Ashgrove Farm supported flocks of lapwing and golden plover *Pluvialis apricaria* early in the winter season. Non cereal/stubble arable field compartments supported mixed flocks of skylark, finches and buntings including corn bunting, yellowhammer, and reed bunting. Birds of prey including sparrowhawk, red kite, and kestrel were all observed hunting in and around arable and ungrazed grassland field compartments.

6.4.117. The sheep-grazed grassland compartments across the Main Site supported a very limited assemblage of wintering birds that included small numbers of skylark and meadow pipit, moderately sized flocks of foraging redwing and fieldfare, and occasional mixed flock of gulls, predominantly lesser black-backed gull *Larus fuscus*. Adjacent hedgerows, scrub and woodland provided roosting sites for resident and migratory overwintering species including wren *Troglodytes troglodytes*, dunnock, and bullfinch, in addition to flocks of winter thrushes and finches. The small woodland blocks additionally supported species such as goldcrest *Regulus regulus*, nuthatch *Sitta europaea*, and treecreeper *Certhia familiaris*. Barn owl regularly used a partially derelict outbuilding at the former Nevilles Farm as a winter roost site. This structure is located outside of the Application Site but at the eastern edge of a field that will be bisected by the Ardley bypass.

6.4.118. The Application Site and adjacent habitats support overwintering populations of golden plover, skylark, corn bunting, yellowhammer, and reed bunting of **County** level significance. The remaining winter bird assemblage recorded is considered to be of **Local** level importance.

Riparian Mammals

6.4.119. Full details of the surveys for evidence of notable riparian mammals and resulting field data are provided in **Appendix ES6.1**.

6.4.120. Otters and water vole are fully protected by the Wildlife & Countryside Act 1981 (as amended) and otters are additionally protected also under the Conservation of Habitats and Species Regulations 2017 ('Habitat Regulations'). Both species are listed in S41 of the NERC Act (2006) and within the Oxfordshire LNRS Species Priorities List.

6.4.121. Targeted surveys for evidence of water vole and otter were undertaken in May and August 2025 along all suitable watercourses and ditches within the Application Site. These extended upstream and downstream beyond the Application Site boundary corresponding with the extent of the River Condition Assessment surveys detailed in Figure 4 of ES6.1: Ecological Appraisal Report. The surveys encompassed relevant sections of Padbury Brook through the M40 J10 Highway Works Area, a tributary to Padbury Brook in the northwest of the Main Site, Ashgrove Brook through the centre of the Main Site, and Gagle Brook at the location of the proposed crossing point by the Middleton Stoney Relief Road. Habitats bordering the watercourses were included within the survey area, with survey areas encompassing adjacent woodland stands and hedgerow bases within the Main Site and extending throughout the adjacent Gagle Brook woodland corridor.

6.4.122. Surveys for water vole and otter had also previously been undertaken across the Application site in June and September 2021, with additional survey of Padbury Brook undertaken in September 2022.

6.4.123. A single record of otter dated from 2008 was returned during the desk study, located in association with Trow Pool LWS which connects to the Gagle Brook. The desk study returned no water vole records were returned from the local area.

6.4.124. The surveyed section of Padbury Brook is located between two culverts, the eastern culvert is c.60m in length and passes beneath the A43, and western one is c.100m in length and passes under the M40. The c.80m open channel between these is highly engineered and narrow, with no bankside vegetation present and no opportunities for water vole to burrow. Only a very shallow water level (<10cm) was present at the time of surveys. Whilst otters are known to use relatively short lengths of culverts under roads, the c.240m length of engineered channel, much of it enclosed, represents a likely barrier to the movement of otter. No evidence of water vole or otter was recorded during surveys, and it is considered that these species are highly unlikely to utilise this section of Padbury Brook.

6.4.125. No evidence of water vole or otter was recorded during survey of Ashgrove Brook or the tributary to Padbury Brook located within the Main Site, though rat burrows and rat dropping were recorded at Ashgrove Brook, along a wooded section of the channel immediately south of Camp Road. These watercourses are considered to offer very limited potential for otter due to their low water levels, tendency for sections to dry out completely, and low

levels of emergent/bankside vegetation. Similarly, they provide only very limited foraging opportunities for water vole, and high levels of overshading of the Padbury Brook Tributary and sections of Ashgrove Brook further reduce the suitability of each to support this species.

6.4.126. Whilst it is feasible otter could forage or commute along the Ashgrove Brook corridor on occasion when the water levels permit, for much of the year the feature not considered to constitute significantly important habitat. The presence of otter and of water vole within the Main Site is therefore considered unlikely.

6.4.127. The section of Gagle Brook subject to survey is bordered by tall, mature woodland that limits the growth of bankside vegetation along much of its length. The channel is generally 1-2m wide, with a maximum depth of approximately 30-40cm and was confirmed during survey to support a potential otter prey species (signal crayfish *Pacifasticus leniusculus*). No evidence of water vole or otter was recorded within the Gagle Brook corridor during surveys however this feature has potential to support otters as part of a more extensive home range (otter territories can extend up to 35km and 25km for males and females respectively).

6.4.128. Otters are a widespread species with populations increasing within Oxfordshire in recent decades[51]. Occasional use of suitable habitat such as the Gagle Brook is consistent with their known distribution within the county. Whilst they may only make occasional use of the suitable habitats in the Application Site, given otter is a Priority Species they are considered to be of County importance.

6.4.129. A narrow corridor of woodland and marginal vegetation had been cleared in mid-/late summer 2025 along a c.30m length adjacent to the Gagle Brook that will likely enable marginal vegetation and other ground cover to develop in the short- to medium- term (until the canopy closes again) that could benefit water vole, if present locally.

6.4.130. No water vole records were returned from within the 1km desk Study Area however and habitat availability for the species was limited within the Application Site, comprising small watercourses with poaching and over-

[51] Oxfordshire County Council 2024. Species Priorities List. Oxfordshire's Local Nature Recovery Strategy. Draft version 06 September 2024. Available at: https://www.oxfordshire.gov.uk/residents/environment-and-planning/local-nature-recovery-strategy [Accessed 02.09.25].

shading that further reduced the extent of available habitat. Given the poor quality of available habitat and absence of field signs it is considered likely that water voles are absent. Water voles do not pose a constraint to the proposals and are scoped out of further assessment.

Aquatic Species

6.4.131. All watercourse sections within the Application Site with the exception of the highly modified section of Padbury Brook that crosses J10 of the M40 are minor tributaries within the upper reaches of Padbury Brook and Ashgrove/Gagle Brook and dry out regularly (recorded dry or mostly dry during each summer of the extended survey period. **Appendix ES6.1** provides individual descriptions, including photographic records at Appendix C. As such on-site watercourses are considered unsuitable to provide habitat suitable to support fully aquatic species such as fish and aquatic macroinvertebrates other than on a very seasonal basis. Habitats are however suitable to support more generalist semi-aquatic species where these are able to also utilise non-aquatic habitats, including those with a mobile phase such as flying invertebrates that can relocate to alternative habitat. Given their ability to utilise alternative habitats generalist semi-aquatic species are not considered to meet the criteria of IEFs and are scoped out from detailed assessment.

Invertebrates

6.4.132. Full details of the below surveys and resulting field data are provided in **Appendix ES6.7**.

6.4.133. The majority of the Main Site and Highway Works areas provide very limited habitats suitable to support notable invertebrate species, being dominated by intensively managed habitats of low ecological value for this group. Several common and widespread butterfly species were noted as incidental records within grassland within the Application Site and commuting along the hedgerows, including a single S41 NERC Act (2006) species, small heath butterfly *Coenonympha pamphilus* observed within grazed grassland to the south of the Main Site.

6.4.134. Grassland and scrub habitats within the Ardley Cutting and Quarry SSSI provide suitable habitat for butterfly species for which the SSSI was notified, including Duke of Burgundy. No records of this species were provided by the TVERC or through direct correspondence with the Berks, Bucks & Oxon

Wildlife Trust (BBOWT) Ecology Officer. Two historic records of small blue were identified during the desk top study dated from 2003, but no more recent records.

6.4.135. A series of targeted butterfly surveys involving eleven walked transects were undertaken in accordance with Butterfly Conservation methodology[52] during the flight period of the key species recorded in the SSSI citation, in May, June and July 2025. Prior to this an earlier series of eleven transects had been undertaken in June-August 2022. Cumulatively these recorded a total of 26 species. Whilst there is considerable overlap between the two datasets, one notable difference is that small blue was not recorded present in 2022 but was recorded on 41 occasions during the 2025 surveys.

6.4.136. The most frequently recorded species during the 2025 surveys were marbled white *Melanargia galathea*, meadow brown *Maniola jurtina* and gatekeeper *Pyronia tithonus*, and the least frequently encountered butterfly species were brown argus (two records in one survey), dark green fritillary (three records across two surveys) and painted lady *Vanessa cardui* (single record). Whilst butterflies were recorded the entire length of the transect route these were notably less numerous within the northernmost section northwest of Ardley Quarry Wood.

6.4.137. With the exception of small blue, brown argus, green hairstreak *Callophrys rubi*, dark green fritillary and grizzled skipper *Pyrgus malvae* the remaining 21 species are considered common and widespread and are typical of the grassland and woodland, woodland/scrub edge habitats present within the Application Site. No evidence of the targeted species of Duke of Burgundy or dingy skipper *Erynnis tages* was recorded. Overall, the butterfly assemblage is considered to be of **Local** level importance.

Hazel Dormouse

6.4.138. Hazel dormouse is considered rare within Oxfordshire[53] and, excluding recent reintroduction sites, at the northern limit of its distribution range. Known populations within the county are primarily located to the southeast of Oxfordshire, around Henley-on-Thames.

[52] Butterfly Conservation 2022. G2: Field Guidance Notes for Butterfly Transects [Online]. Available from: https://ukbms.org/sites/default/files/downloads/UKBMS%20G2%20Transect%20field%20guidance%20%20notes.pdf [Accessed 22.07.25].
[53] Bullion, S., Wolton, R., and White, I. 2025. *Hazel Dormouse Conservation Handbook*. 3rd Edn. Mathews Ed. Mammal Society.

6.4.139. No hazel dormouse records were returned from TVERC from within 2km of the Application Site, and the Multi Agency Geographic Information for the Countryside (MAGIC) website lists only two hazel dormouse European Protected Species Licences (EPSL) located within 30km, both located to southeast of Upper Arncott and dating from 2015. The closer of these is located c.7.4km from the proposed M40 J9 works and c.10.7km from the remainder of the Proposed Development (excluding within-highways works along the B4030). The corresponding distances for the second EPSL site are c.8.3km and c.11.3km respectively. Consultation with the NBN Atlas did not identify any records closer to the Application Site than the two Upper Arncott sites, i.e. no existing records within 10km of the main Application Site.

6.4.140. Hazel dormouse is generally closely associated with areas of dense woody vegetation cover with a wide diversity of woody species contributing to three-dimensional habitat complexity, diverse food sources, suitable nest sites and good connectivity to other areas of suitable habitat in the local landscape. Optimal habitat for hazel dormouse is considered to comprise woodland stands of >10ha[54] with good structural and plant species diversity and with habitat connectivity within the landscape (an average density of 10km hedgerow per km^2 is suggested[55]), or landscape including woodland areas greater than c.20ha if good habitat connectivity is lacking[56].

6.4.141. Field boundary habitats within the Application Site are characterised by species-poor hedgerows with few if any standard trees that are intensively managed and subject to regular flailing. Woodland stands are few in number and small (<2.5ha), albeit with some limited connectivity among those adjacent to Ashgrove Brook. The only exception is the woodland corridor along the Gagle Brook west of the M40 that extends across c.14ha through the wide landscape, of which c.0.41ha lies within the Middleton Stoney Relief Road works corridor and a smaller c.0.08ha section is encompassed within the area proposed for the eastern rail track connection. A nest tube survey for the species was undertaken along an intervening section of the brook corridor and adjacent habitats in June-September 2023 for a neighbouring application (Planning Ref MW.0049/23). This recorded no evidence of the presence of dormice.

[54] Bright, P., Morris, P and Mitchell-Jones, T. 2006. *The Dormouse Conservation Handbook*. 2nd Edn. English Nature.
[55] Staley, J.T., Wolton, R. and Norton, L. 2020. *Definition of Favourable Conservation Status for Hedgerows*. UK Centre for Ecology and Hydrology. Natural England Publication. RP2943, and Staley, J.T., Wolton, R. and Norton, L.R. 2023. Improving and expanding hedgerows – recommendations for a semi-natural habitat in agricultural landscapes. *Ecological Solutions and Evidence* 4 e12209.
[56] Bright, P.W., Mitchell, P. and Morris, P.A. 1994. Dormouse Distribution: Survey Techniques, Insular Ecology and Selection of Sites for Conservation. *Journal of Applied Ecology* 31:329-339.

6.4.142. With the exception of small sections of the Gagle Brook corridor the Application Site is therefore characterised by a mosaic of unsuitable and sub-optimal habitats for hazel dormouse with poor habitat structural complexity and very limited connectivity to areas of more suitable habitat in the wider landscape. Given the absence of species records, the poor quality and connectivity of on-site habitats generally, and the Application Site being located almost at the limits of the species' distribution range it is considered very unlikely that the Application Site currently supports the species.

6.4.143. The CDC and OCC Ecologists were consulted with regard to a best practice approach and proportional level of survey effort with regard to hazel dormouse. It was agreed that given the low suitability of habitats that will be impacted, a nut search methodology could be considered appropriate, as long as the results of such a search and of an updating consultation with TVRC were negative for the species. These were duly undertaken and identified no evidence of this species. As such hazel dormice is considered very unlikely to be present within the Application Site, and further survey for the species was scoped out.

Other Protected/Notable Fauna

6.4.144. Brown hare was confirmed present within the Application Site via incidental records made during site visits and within the surrounding desk Study Area. The arable and grassland habitats are suitable for this species and the woodland habitats provide suitable permanent cover habitat. Brown hare is listed on S41 of the NERC Act (2006) and is therefore a species of principal importance for conservation. It is however widespread throughout Oxfordshire[57] and England, with currently stable populations. The presence of a resident population within the Application Site is considered to be of **Sub-Local** ecological importance.

6.4.145. Recent hedgehog records were returned from within the desk Study Area, several from within Bicester but including two records from Middleton Stoney. The species was not recorded during any field surveys, although potential habitat for this species was present comprising the woodland, hedgerows and scrub, and the species is likely to be present across the Application Site in low numbers. Hedgehogs are a NERC Act (2006) species of principal importance with declining populations nationally. Given the Application Site is dominated by arable land, grazed grassland and a managed hedgerow

[57] Newbold, P. Parle-Gelling, M., Cowley, B. e*t al.* 2017. *Oxfordshire Mammal Guide*. Oxfordshire Mammal Group.

network it is considered to be of no more than **Local** ecological importance for hedgehog.

6.4.146. Polecat records were returned from the east of the M40 and from the southwestern extent of Bicester. These records are assumed to be native rather than hybrid in order to present a worst case for this assessment. Polecat is a NERC Act (2006) species of principal importance but is considered common and widespread within Oxfordshire[58]. The species is closely associated with dense habitats such as woodland, mature hedgerows, scrub and tall grassland for hunting and burrow creation. Whilst present such habitats have limited coverage within the Application Site with the more extensive arable and grazed grassland habitats considered sufficient to reduce the likelihood that a significant polecat population is present. Given the availability of more suitable habitats in the wider area, any polecat population present is considered to be of no more than **Local** importance.

Invasive species

6.4.147. As noted above, signal crayfish a non-native invasive species was confirmed present within the Gagle Brook in the vicinity of the proposed Middleton Stoney Relief Road crossing. This species has the ability to cross dry land in order to colonise nearby aquatic habitats therefore has the potential to be present at low densities throughout neighbouring watercourses on a permanent or seasonal basis.

Summary of Important Ecological Features

6.4.148. Table 6.9 identifies those habitats and species recorded at and in the vicinity of the Application Site evaluated as being of 'local' nature conservation value or above and which are therefore classified as IEF. Features identified as having below local value (individual trees, all static waterbodies other than pond P50) 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 Application Site to them and/or small numbers recorded. Water vole and brown hare have been scoped out of further assessment and are not considered further.

[58] Oxfordshire Mammal Group 2017. Oxfordshire Mammal Guide. Oxfordshire Mammal Group.

Table 6.9: Summary of Important Ecological Features

Important Ecological Feature	Location and Comments	Nature Conservation Importance
Ardley Cutting and Quarry SSSI	A nationally recognised assemblage of habitats of value with biological and geological SSSI status located along the Chiltern Main Line railway. Includes calcareous grassland and supports a GCN population and notable invertebrate assemblage.	National
Ardley and Upper Heyford CTA	A Conservation Target Area that identifies targets for habitat creation and management including calcareous grassland, hedgerows, grassland management, GCN and geological conservation.	County
Ardley Road Verge Nature Reserve DWS	A mosaic of calcareous grassland, scrub and hedgerows which supports a population of the rare plant meadow clary.	County
Upper Hayfield Airfield LWS, Ardley Fields Quarry LWS, Ardley Fields Ponds West LWS, Ardley Fields Pond East LWS, Trow Pool LWS, Stoke Wood LWS, Tusmore and Shelswell Park CTA	Local Wildlife Sites which support assemblages of habitats including calcareous grassland, woodland, breeding GCN populations and bird species.	County
The Heath pDWS, Trackway adjacent to The Gorse pDWS, Kennel Copse pDWS	Potential Cherwell District Wildlife Sites that supports species-rich hedgerows and woodland.	County
Middleton Stoney Cricket Ground pLWS	Cricket ground encompassing an area of lowland calcareous grassland.	County
Shakespeare Drive (King End Conservation Area) DWS	Urban site encompassing semi-improved grassland with treelines and plantation woodland strips. Central waterlogged areas support elements of lowland meadow.	County
Digging Copse / Grunthill Copse / Kirdy's Copse.	Ancient Woodland.	Local
Calcareous grassland	Unimproved calcareous grassland including stands of NVC community CG4 *Brachypodium pinnatum* grassland, CG3 *Bromus erectus* grassland, and an upright brome / tor-grass community representative of NVC community CG5 *Bromus erectus* - *Brachypodium pinnatum* grassland corresponding to 'Lowland Calcareous Grassland' Habitat of Principal	National

Important Ecological Feature	Location and Comments	Nature Conservation Importance
	Importance associated with the SSSI, and neutral and calcareous grassland associated with the Ardley Road Verge Nature Reserve partially located within the Main Site.	
Unimproved neutral grassland	Mestrophic grassland communities MG1d corresponding to 'Lowland Meadows' Habitat of Principal Importance associated with the SSSI within the Main Site.	National
Neutral **grassland**	Neutral grasslands with reasonable floral diversity associated with the Main Site and Middleton Stoney Relief Road.	Local
Semi-natural woodland	Small area of The Heath pDLW located within the Main Site, riparian woodland along Gagle Brook associated with the Middleton Stoney Relief Road and part of Sycamore Grove Woodland associated with the Junction 10 Highway Work improvements. Identified as 'Lowland Woodland' Habitat of Principle Importance.	Local – County
Plantation woodland	Areas of mixed, deciduous and coniferous woodland within the Main Site were mature and provided structural and some botanical diversity to the site and shelter and foraging for local fauna. Areas of road verge tree groups and plantation blocks at the edges of arable fields associated with the Highway Works.	Local
Veteran tree	Three NNPS veteran trees within the Application Site and a single NNPS veteran located outside of the Application Site but within influencing distance of the Proposed Development. 27 other trees qualifying as Irreplaceable Habitats under Regulations 2024.	National
Hedgerows	Hedgerows are a common and widespread habitat locally but provide structural diversity and habitat connectivity as well as a S41 NERC Act (2006) habitat. The hedgerows across the Application Site provided a good network of hedgerows and six hedgerows were identified as being important under the Hedgerow Regulations 1997.	Local – County
Watercourses	Limited aquatic and marginal vegetation associated within Padbury Brook Tributary and Ashgrove Brook within the Main Site, Padbury Brook within the Junction 10 Highway Works Area, or the Gagle Brook section to the southeast. Gagle Brook is a valuable habitat corridor that runs through the Highway Works areas and beyond the Order Limits.	Gagle Brook – County (All other watercourses – Local/Site)

Important Ecological Feature	Location and Comments	Nature Conservation Importance
Waterbodies	Ponds provide a water source and stepping stone habitats for aquatic flora and fauna, however the ponds present were only of poor condition and value to biodiversity.	P50 – Local
Notable plants	Field scabious associated with Ardley Road Verge Nature Reserve	Local
	Basil thyme recorded within the SSSI (in 2022 but not 2025).	County
Badgers	Badgers are afforded protection under the Protection of Badgers Act 1992. Badgers are present within the site and across the surrounding area.	Local
Bats	All bats protected under EU and UK law with several species being UK priority species. Surveys confirmed the bat assemblage to primarily comprise common / widespread species, with some regular use of linear features (hedgerows, plantation edges and brook corridors) by several species. Barbastelle bat an Annex II species, was confirmed present, with generally low-level activity levels noted and consistent with occasional foraging activity by individual bats, with linear features also used as commuting corridors. The timing of activity was not indicative of the presence of a barbastelle roost in the vicinity. Small, non-breeding common pipistrelle and brown long-eared bat roosts were confirmed present within buildings associated with Ashgrove Farm. No roost sites were identified in association with trees present on site.	Local
GCN (Breeding habitat)	Protected by EU and UK law. NERC Act (2006) and LBAP priority species. Four largely off-site metapopulations were identified that encompass ponds on land to the west associated with the Upper Heyford Airfield, and land to the north, east and north-east. A single GCN was recorded within the Application Site, associated with Metapopulation 1.	County
Reptiles	Common lizard, grass snake and slow worm populations within suitable habitats throughout the Application Site.	Local
Breeding Birds	71 bird species were recorded utilising habitats within the Application Site during the 2025 breeding bird surveys, 41 of which were considered notable (i.e. listed as red or amber on the BoCC list, featured under Schedule 1 of WCA 1981 as	Local

Important Ecological Feature	Location and Comments	Nature Conservation Importance
	amended or a NERC Act (2006) species of principal importance). Common and widespread, but declining, farmland bird species were recorded, with bird nesting and foraging activity within open arable and grassland field compartments, woodland/ plantation woodland, scrub and hedgerows. Surveys of the northwest fields in 2026 did not record any additional species.	
	Field compartments and associated boundary hedgerows supported breeding skylark and yellowhammer, occasionally in significant numbers.	County
Winter Birds	71 bird species were recorded utilising habitats within the Application Site during the 2024-25 wintering bird surveys, 36 of which are considered notable (i.e. listed as red or amber on the BoCC list, featured under Schedule 1 of WCA 1981 as amended, or a NERC Act (2006) species of principal importance). Common and widespread, but declining, farmland bird species were recorded, with bird nesting and foraging activity within open arable and grassland field compartments, woodland/plantation woodland, scrub and hedgerows. Several raptor species present over winter.	Local
	Habitats supported overwintering notable populations of golden plover, skylark, corn bunting, yellowhammer, and reed bunting.	County
Invertebrates	NERC Act (2006) and LBAP priority species. 26 butterfly species recorded within the vicinity of the Ardley Cutting and Quarry SSSI/Ardley Wood.	Local
Otter	Potential occasional use of watercourses and riparian habitat within the Application Site.	County, if present
Hazel Dormouse	Not considered to be present, however given the legislative protection afforded to hazel dormouse consideration is given as precautionary measure.	Considered absent
Other species: hedgehog, and polecat.	Confirmed presence of within the wider area via the desk study. Habitats present are characteristic of the local area, with comparable habitats adjoining and surrounding the Application Site.	Local, if present

Future Baseline

6.4.149. In the absence of development, and assuming current management practices continue it is anticipated that the Application Site would be retained as managed agricultural land of limited ecological value, but including ponds, the brook corridors, woodland and plantations, field perimeter hedgerows and associated trees. These would be subject to occasional ongoing management which would maintain them in their current condition and continuing to provide some ecological value and structural diversity across the Application Site.

6.4.150. It is further anticipated that the management of the SSSI habitats within and adjacent to the Application Site would continue to lie within the remit of Network Rail and would continue as presently. The most recent condition assessment of the habitats within the Ardley Cutting and Quarry SSSI completed by Natural England was in August and September 2012 which concluded all constituent units were in "unfavourable – recovering" condition. The sustained recovery of these habitats is reliant on the application of appropriate management.

LNRS and Local Conservation Target Areas

6.4.151. Land within the Application Site currently lies largely within private ownership, with the remainder comprising land controlled by the Highways Authority and Network Rail. As such there is no mechanism currently in operation to provide landscape level enhancements for biodiversity, with existing enhancement restricted to localised endeavours such as the management of ponds within the adjacent airfield and the Ardley Fields Ponds LWSs for the benefit of GCN, and scrub control measures within the Ardley Cutting and Quarry SSSI and Ardley Road Verge. In the absence of development, it is assumed that current management practices would continue, i.e., there would be no concerted approach to progress towards the LNRS or CTA targets.

Mineral Extraction Works

6.4.152. No parts of the Order Limits are currently undergoing mineral extraction or are planned for extraction works in the future.

6.5 ASSESSMENT OF LIKELY SIGNIFICANT EFFECTS

6.5.1. A full description of the Proposed Development is provided in Chapter 2. The potential ecological effects arising as a result of the Proposed Development have been assessed with regard to the Parameters Plan (Document 2.5) and

description of the Development and construction works set out in Chapter 2 of this ES. Regard has been given to the landscape proposals outlined in Chapter 7 and to the Illustrative Masterplan (Document 2.6) which presents one option for how the Proposed Development may be delivered in accordance with the Parameters Plan.

6.5.2. The assessment of likely significant effects considers mitigation embedded by design into the scheme, as summarised in paragraphs 6.5.14 to 6.5.24, but is otherwise based in the first instance on the scenario of the Proposed Development taking place in the absence of any additional mitigation. An assessment of residual impact then follows (Section in 6.6, from paragraph 6.6.59 and also Table 6.16) that has regard to all the proposed mitigation, including any further, additional mitigation measures identified.

6.5.3. The significance of an impact is a matter of professional judgement but can be described in general terms as being a product of the ecological or nature conservation value of a site, habitat, species (the receptor) and the magnitude of the predicted impact.

6.5.4. Potential effects prior to additional mitigation are outlined below:

Construction Phase

- Direct loss or gain of habitats and associated flora/fauna within the development area, interruption/enhancement of wildlife corridors, and the change in population density/areas of species and/or habitats;
- Indirect impacts on retained vegetation within and bordering the Proposed Development area through local changes in soils, drainage and hydrology;
- Potential impacts upon protected and/or scarce species through disturbance;
- Short- to medium-term construction impacts such as via pollution incidents from chemical spills, damage to habitats through informal access and imprecise working corridors, dust deposition and effects upon semi-natural habitats from runoff and discharge or via the incorrect storage of materials;
- Potential impacts post construction such as degradation through the introduction of possible alien or undesirable species, increases in recreational use leading to trampling and other such effects on fauna and flora; and

- Beneficial effects arising as a result of the favourable enhancement of parts of the Application Site to beneficial after-use.

Operational Phase

- Air pollution and dust impacts, pollution of streams and fragile habitats from chemical spills, runoff or incorrect storage of materials;
- Introduction of increased lighting and noise on habitats and species;
- Recreational pressures on habitats and surrounding areas/sites;
- Impact of increased traffic flows (in relation to collision with species); and
- Alteration of ground water flows due to increase in hardstanding, introduction of drainage etc.

Application of the Mitigation Hierarchy

6.5.5. The Proposed Development has been developed via an iterative design process and, in accordance with policy and best practice guidance (NPPF 2024 and BS42020:2013[59]) has followed the 'mitigation hierarchy' which promotes the avoidance of impacts as a first priority, then mitigation, with compensation only as a last resort. As such, the scheme has been designed with consideration of identified IEFs, and where possible avoids, reduces or mitigates potential adverse effects on these. This has resulted in a development design that incorporates the retention of ecologically valuable features where possible as integral components of the site green infrastructure (GI) and hence maintains habitat connectivity throughout the Proposed Development for a range of priority fauna and flora present on site and in the local area.

6.5.6. Where retention of IEFs is not possible, new habitat creation including extensive native tree and shrub planting and species-rich grassland including priority calcareous grassland and lowland meadow is proposed (as shown on the Illustrative masterplan, Document 2.6) to compensate for habitat losses and to deliver overall biodiversity gain (see ES Appendix ES6.9: Biodiversity Net Gain Assessment).

<u>Project Design – Alternative Sites Assessment</u>

[59] BS42020 Biodiversity – Code of Practice for Planning and Development 2013.

6.5.7. Schedule 4, Part 2 of the Town and Country Planning (Environmental Impact Assessment) Regulations 2017 require Environmental Statements to include "a *description of the reasonable alternatives* (*for example in terms of development design, technology, location, size and scale*) *studied by the developer*", including site location, with indications for the main reasons for choices that have been made. This process additionally addresses the requirements of Paragraph 193 a) of the NPPF (albeit not the primary source of policy for NSIPs), "*When determining planning applications,... if significant harm resulting from a development cannot be avoided* (*through locating on an alternate site with less harmful impacts*), *adequately mitigated, or, as a last resort, compensated for, then planning permission should be refused*".

6.5.8. An Alternative Sites Assessment (ASA) was undertaken to identify the most preferable site within the established Search Area for the delivery of a SRFI (see Chapter 2: Description of Development, and Appendix 2.4). This considered where substantial gaps in the national network of existing, consented and proposed SRFIs were located, and implications of relevant national policy guidance and established approaches adopted by previous applications for locating SRFIs, including proximity to strategic rail and road infrastructure and key environmental constraints. Location specific policy and logistical considerations were also considered, and potential sites were furthermore screened on the basis of scale, with those less than 60ha in extent or lacking capacity to handle four or more trains a day screened out. From the resulting short-list of four potentially feasible sites identified for detailed consideration, the proposed OxSRFI Site was identified as the preferred option.

6.5.9. Regarding the scale of the proposals the OxSRFI Main Site would be approximately 300ha in extent (including proposed landscaping, but excluding highways works), however as noted in the ASA all other recently approved and proposed SRFI are of a similar scale and therefore, it is considered by the Applicant that significantly smaller sites are less likely to be able to meet all of the requirements to deliver a viable SFRI.

Project Design – Avoidance

6.5.10. The Ardley Cutting and Quarry SSSI encompasses a 6.1km section of the Chiltern Mainline and associated cutting and extends 2.1km north-west from the Application Site boundary and 1.3km southeast. As such it is not feasible to create a rail connection from the existing trackway to the Main Site that avoids the SSSI. Similarly, there is no option for routing the Ardley Bypass via an alternative route that avoids going over the SSSI corridor. The project

design therefore has sought to balance the requirement for rail connectivity with minimising the scale of impacts to the SSSI. Therefore, of the 9.36ha of SSSI habitats located within the Order Limits, habitat loss due to the development will be limited to a total of 0.43ha SSSI habitat from the southern rail line embankment in the northwest of the Main Site and 2.46ha from the SSSI in the east, with the intervening section of the SSSI corridor retained. These losses represent 7.2% of the total SSSI area. 45.0% of this loss comprises non-priority built linear habitat along the route of the existing rail track and encroaching scrub. The Ardley Bypass is orientated almost perpendicular to the SSSI, minimising the area subject to shading by the bypass bridge above.

6.5.11. The site boundary originally encompassed all of Ardley Road Verge Nature Reserve but has been modified to exclude direct impacts to the area of roadside grassland supporting meadow clary.

6.5.12. Throughout the remainder of the Application Site the design of the Proposed Development has sought to retain (and protect, avoiding damage or loss) the most important habitat features and maintain habitat connectivity. The majority of the watercourses, linear woodland stands along and adjacent to Ashgrove Brook through the Main Site and existing tree cover along the eastern perimeter of the Main Site will therefore be retained and protected throughout construction, as specified within the CEMP (and see also the Tree Retention Plans within Document series 2.15). Furthermore, the shrub and grassland habitat surrounding the off-site Ardley Road Verge Nature Reserve will be retained and protected, as will areas of broadleaved woodland in the vicinity of the M40 Junction 10 Highways Works.

6.5.13. Where appropriate seasonal timing constraints to works will be employed, as specified within the CEMP, to avoid impacts to priority fauna.

Mitigation By Design (Embedded Mitigation)

6.5.14. The embedded mitigation measures outlined below are either considered integral to the design of the Proposed Development; committed mitigation that is defined and secured through proposed DCO Requirements or other obligations such as through commitments to adopt standard best practice and recognised industry standards, or in the case of protected species/ derogation licences can realistically be expected to be granted as a result of legislative requirements. The assessment of effects therefore assumes that good practice embedded mitigation will be implemented and will be effective as an integral part of project design. For the construction process many of

these standard and best practice measures are 'embedded' through the CEMP (Appendix 2.3) which provides the context and framework for more detailed, phase specific 'P-CEMPs'.

6.5.15. The UK Government made regulations in November 2026 for the delivery of biodiversity net gain by NSIPs.The Government has confirmed that this requirement will apply to NSIP applications made on or after 02 November 2026.

6.5.16. The statutory requirement for BNG therefore does not apply to the Proposed Development. However, in light of this clear 'direction of travel' of Policy, the Applicant is keen to deliver a 10+% biodiversity net gain (BNG) through design and mitigation provided as part of the OxSRFI scheme. To this end the delivery of a net biodiversity gain, and corresponding long-term sensitive management of on-site habitats as outlined below, is therefore considered embedded mitigation within the Development proposals.

6.5.17. A Biodiversity Net Gain Assessment has therefore been undertaken based on the Illustrative Masterplan using the statutory metric v.1.0.4[60]. This demonstrates that the Proposed Development is capable of delivering a 10% net gain in biodiversity within the Application Site for all three categories assessed by the metric, namely habitats, hedgerows, and rivers. The biodiversity offsetting assessment is provided in Appendix ES6.9: Biodiversity Net Gain Assessment.

6.5.18. The accompanying Habitat Management and Monitoring Plan (HMMP) (Appendix ES6.11) provides a detailed framework for the future management and monitoring of habitats on site for a minimum 30-year duration post development. Adherence to the HMMP and to subsequent phase-specific P-HMMPs will ensure retained, newly enhanced and created habitats are appropriately managed such that they attain their target habitat conditions as inputted into the BNG metric, with any habitat establishment failures identified via scheduled monitoring checks and rectified via amended management as required.

6.5.19. The SRFI design additionally considered and was informed by the relevant conservation targets of the Ardley & Heyford CTA that subsequently informed development of the Oxfordshire LNRS, namely the management, restoration and creation of calcareous grassland and lowland meadow, broadleaved woodland creation, management and restoration of hedgerows, grassland

[60] https://www.gov.uk/guidance/biodiversity-metric-calculate-the-biodiversity-net-gain-of-a-project-or-development

management including buffering to support ground nesting birds, and management of ponds and terrestrial habitat to conserve the conservation status of GCN.

6.5.20. The provision of new priority habitats as outlined above, in addition to wet grassland, native species buffer planting, native scrub and hedgerow planting, Sustainable Drainage System (SuDS) and pond habitats as part of the delivery of the embedded green infrastructure will increase the habitat diversity of the local area and contribute to permanent beneficial effects for a range of habitats and species. Green infrastructure creation will incorporate both new planting and retained habitats and will be undertaken in a phased manner in tandem with the associated phases of construction. As such the GI provides scope for the mitigation of necessary losses of IEF habitats, as indicated within the Illustrative Masterplan (Rev P25) and will furthermore contribute to the mitigation of operational/long-term effects. The proposed GI is appropriate to enable a net biodiversity gain to be achieved across the Application Site, as detailed in **Appendix ES6.9**.

6.5.21. The provision of alternative habitat features for notable fauna including artificial badger setts, bat boxes/roost sites and wildlife ponds will benefit the species subject to legislative protection and embedded mitigation via Natural England licencing.

Key Habitat embedded mitigation

6.5.22. A number of principal habitat mitigation measures will be delivered via the development design (embedded mitigation) as secured by the Parameters Plan, and other certified documents including the HMMP, Design Approach Documents (Document series 5.5) and also illustrated within the Illustrative Masterplan, including:

- The Proposed Development minimises construction in the vicinity of the retained brook corridors, which will be buffered within broad habitat corridors, and will retain the existing hedgerows and mature trees, including those within woodland/plantation woodland. Where avoidance of all habitats of ecological value has not been possible, the design has sought to avoid those of highest ecological importance and with highest sensitivity to effects.
- Maintenance of habitat connectivity is promoted within the development design, with the proposed GI incorporating significant continuous habitat corridors including scrub and woodland around the Main Site

and forming new screening / roadside planting along new Highways infrastructure, linking to adjacent areas of high-quality habitat creation.

- Native species greenspace will be delivered within each phase and will include native species woodland belts with woodland edge and scrub mixes created in association with species rich hedgerows and mixed grassland habitats and will enhance connectivity between the site and off-site habitats.
- The GI will create new habitat links and improve habitat connectivity to Ardley Cutting and Quarry SSSI, local LWSs and Ardley Road Verge Nature Reserve and to other habitats beyond the site boundary and will contribute towards several of the habitat priorities highlighted within the Oxfordshire LNRS. This includes the creation of calcareous species-rich grasslands, including on the newly exposed subsoils of the rail track cutting created on site; creation of other neutral species-rich grasslands; creation of new woodland, and areas of habitat that contain a matrix of habitat types including small woodland patches, scattered trees, scrub, and grassland; the enhancement of watercourse sections and management of riparian habitats to achieve good ecological condition, and creation of new ponds to increase biodiversity and create more clean water habitats.
- The enhanced habitat diversity across the Site and will furthermore deliver foraging, nesting and shelter opportunities for priority fauna such as farmland birds, brown hare and bats.
- Watercourses will be enhanced by virtue of the adjacent land being taken out of arable management and replacement of adjacent habitats, primarily with native grassland and shrub, thereby reducing bank top encroachment.
- The surface water management system will include a SuDS scheme comprising a series of vegetated basins situated within a broad habitat corridor to the south of the Main Site (around the Heyford Park Link Road). These will incorporate over-deepened sections to provide further habitat diversity and will benefit GCN and other local fauna by creating foraging and shelter opportunities and ‘stepping-stone’ habitats linking off-site habitats to the east and west.
- Where possible locally sourced native species shall be used and any known invasive plant species, including those listed on Schedule 9 of the Wildlife and Countryside Act 1981 (as amended) shall be avoided.

- Maintenance and enhancement of public footpaths will direct recreational access to a network of accessible pathways and discourage the formation of informal paths through areas of priority habitat.

6.5.23. Proposed habitat creation provided over and above the embedded mitigation is discussed within Section 6.6 of this chapter and is identified within Figures 11 and 12 of Appendix ES6.9 – Biodiversity Net Gain Report.

6.5.24. The analysis of soil samples taken from areas proposed for extensive lowland meadow and calcareous grassland creation within the on-site green infrastructure has confirmed the suitability of underlying soils for this purpose, being predominantly calcareous in nature with low phosphate availability and moderate/moderately low levels of organic matter (Appendices 1 to 3 within Appendix ES6.11: HMMP).

Lighting

6.5.25. The lighting assessment (Chapter 8) describes the proposed lighting strategy which has regard to ecological standards and requirements[61]. This identifies appropriate positioning and orientating of luminaires and the use of shields or cowls to ensure that any artificial lighting of potentially sensitive ecological receptors during the operational phase is negligible and within the range of natural moonlight (<0.4lux).

Measures Required as a Legislative Requirement

6.5.26. The following measures are legislative requirements and as such are considered 'embedded' by way of necessary compliance with the relevant legislation listed. Appropriate precautionary working procedures are detailed within the CEMP to ensure that the relevant legislative requirement will be met, including timing constraints to certain activities, any necessary phased undertaking of works, the requirement for specific activities to be undertaken or supervised by the Ecological Clerk of Works, and the timing of provision and construction of mitigation and enhancement features.

6.5.27. The Protection of Badgers Act 1992 (as amended) makes it a potential offence to kill, injure, take, possess or cruelly treat a badger; intentionally or recklessly interfere with a sett or disturb a badger when it is occupying a sett.

[61] Bat Conservation Trust & Institute of Lighting Professionals (ILP) 2018. *Guidance Note 8: Bats and artificial lighting in the UK.* Bats and the Built Environment Series.

6.5.28. All bats in the UK are afforded full protection under the Conservation of Habitats and Species Regulations 2017 (as amended) and the Wildlife and Countryside Act 1981 (as amended). If impacts to bats or bat roost/s cannot be avoided, works are required to be covered by an appropriate licence from Natural England to allow proposals to derogate from the legislation.

6.5.29. GCN are afforded full legal protection under the Conservation of Habitats & Species Regulations 2017 (as amended) and the Wildlife and Countryside Act 1981 (as amended). Where impacts arising from development cannot be avoided, works are required to be covered by an appropriate licence from Natural England (European Protected Species Licence, District Licence or Class Licence) to allow proposals to derogate from the legislation.

6.5.30. Common reptile species are afforded partial legal protection from intentional killing, or injury by the Wildlife and Countryside Act 1981 (as amended). Where present appropriate mitigation measures should be implemented to ensure that reasonable care is taken to avoid harm.

6.5.31. All wild birds are afforded protection by the Wildlife and Countryside Act 1981 (as amended). Appropriate measures such as the sensitive timing of site vegetation clearance and/or the undertaking of a checking survey by an appropriately experienced ecologist prior to works being undertaken during the nesting season are required to avoid harm or disturbance to nesting birds.

6.5.32. Otter is a European Protected Species and consequently afforded protection under Regulation 43 of the Conservation of Habitats & Species Regulations 2017 (as amended) and Section 9 of the Wildlife and Countryside Act 1981 (as amended).

Construction Environmental Management Plan (CEMP)

6.5.33. Most pre-construction and construction phase embedded mitigation will be secured by, and implemented in line with, the CEMP (included at Appendix 2.3). Measures will be implemented during construction to ensure key retained ecological habitats are protected from construction impacts such as damage by construction traffic, pollution incidents, dust dispersal and increased noise and lighting levels, and that works proceed in accordance with relevant legislative elements. These will be secured for each phase of construction through a phase specific CEMP (a ‘P-CEMP’).

6.5.34. As set out in Chapter 2, standard and best practice CEMP actions and measures, including measures required by legislation, are considered

'embedded' mitigation. Appropriate measures will be implemented in line with best practice as outlined within the CEMP to ensure construction works are undertaken in an environmentally responsible manner. Given the phased construction period for delivery of the Proposed Development as a whole, it is anticipated that, where necessary, the CEMP will be informed by updated ecological surveys that are relevant to any particular phase of development. The CEMP will apply the most recent ecological baseline to inform mitigation, the appropriate location and timing of works, the responsibilities of site workers, including Ecological Clerk of Works, and the use of barriers or signage.

6.5.35. Key CEMP measures to prevent, avoid, or otherwise reduce adverse effects on important ecological features are outlined below:

- All retained habitats will be protected during construction by suitably robust fencing and the creation of ecological protection zones. Retained trees will be protected by suitable fencing based on their root protection areas in accordance with BS 5837:2012 Trees in relation to design, demolition and construction – Recommendations. Suitable signs will be installed clearly highlighting retained and sensitive habitats and all site personnel will be briefed as to their responsibilities;
- The release of airborne dust particles during construction will be controlled through the use of best practice measures, with particular care within the vicinity of Ardley Cutting and Quarry SSSI. Appropriate methods will be employed where necessary, including the avoidance of work during extended periods of low rainfall and/or high winds, damping of dust, the use of water suppressant or suitable local exhaust ventilation systems during cutting, grinding and sawing operations, and wheel and machinery washing;
- A surface water management system shall be put in place for each phase prior to works being undertaken, as set out within the relevant P-CEMP. This will detail measures to prevent any increases in runoff to receiving watercourses, to attenuate runoff to mimic the baseline conditions as far as practicable and to appropriately treat runoff discharged from the construction site in order to protect the condition of waterbodies downstream. Measures shall be adopted in accordance with appropriate industry guidance[62].

[62] Currently: Construction Industry Research and Information Association (CIRA) 2001. *Control of water pollution from construction sites. Guidance for consultants and contractors*. CIRIA C532.

- Accidental pollution events will be managed via the use of drip trays and spill kits. Potential pollution via surface run-off will be managed via bunds to control water flow and the use of wheel and machinery cleaning facilities on hardstanding surfaces;
- Site contractors to be briefed and trained regarding good biosecurity practices appropriate to their role;
- Appropriate cleaning methods will be employed when working within or adjacent to watercourses to minimise the risk of spreading signal crayfish or crayfish eggs. Vehicles and other equipment used in the removal of material from watercourse corridors to be thoroughly cleaned and dried prior to and following such works;
- Each channel section will be subject to detailed inspection by the Ecologist prior to commencement of any construction works within or adjacent the channel/s. Where works are required in the presence of water (beyond shallow pools or ditches with no/low flow), appropriate mitigation such as temporary diversion channels or fish rescue and relocation will be implemented at that point in line with established guidance and/or in consultation with the EA to minimise impacts to fish and other aquatic fauna. Screened pumps/siphons and gravity/flume pipes will be utilised where appropriate to maintain habitat connectivity during construction.
- Crayfish monitoring with appropriate biosecurity control procedures are to be followed should signal crayfish or other non-native crayfish species be encountered during construction works. As it is an offence under the WCA 1981 to return removed non-native crayfish to the wild these will be humanely dispatched if identified, with appropriate disposal on site;
- Any material including soil and tree/shrub root balls taken from the banks of a watercourse will be thoroughly assessed and cleaned prior to removal from point of origin or will otherwise be considered contaminated waste and disposed of accordingly;
- Any environmentally hazardous material used will be kept in dedicated stores, and storage tanks will have appropriate bunding;
- Site access routes will be regularly cleared of debris, with collected debris disposed of appropriately;
- Appropriate noise suppression measures such as siting generators away from sensitive features such as the watercourses/hedgerows;

- Applying lighting suppression and avoidance measures to limit the effect of light pollution on retained habitats during construction.
- To avoid disturbance to breeding birds, ground clearance works, vegetation removal and building demolition will where possible be undertaken outside of the bird-breeding season (i.e. avoiding March to September inclusive). If this timing is not possible, the area will be checked prior to removal of vegetation, ground works or building demolition by a suitably experienced ecologist / ECoW. If active nests are found, the relevant vegetation or building will be left untouched and suitably buffered from works until all birds have fledged. Specific advice will be provided prior to undertaking the clearance. This is a statutory requirement due to the protection of all nesting birds and their nests under the Wildlife and Countryside Act, 1981 (as amended).
- Culverts installed along watercourses will be set such that the invert level is below the existing bed level, to prevent impedance of water flow and aquatic fauna.
- Site preparation and habitat removal works within the Gagle Brook corridor and adjoining habitats will proceed in strict accordance with the hazel dormouse non-licenced method statement provided within the CEMP/relevant P-CEMP. This includes a pre-works fingertip survey by an ecologist holding a Natural England license for dormice (or an accredited agent), followed (if dormice are confirmed to be absent) by a two-stage vegetation removal process in order to avoid the main dormouse hibernation and breeding seasons and the peak nesting bird season. In the event dormice are identified all works within the immediate vicinity will cease immediately and the ecologist notified (if not present on site) and an application made for an EPSL in order to enable works to continue. Dormice will not be handled by non-licenced personnel;
- Veteran tree material will be removed from development areas prior to commencement of construction within the relevant phase/s and relocated to a designated deadwood reserve area within the on-site green infrastructure in accordance with the CEMP/relevant P-CEMP and the bespoke Veteran Tree Strategy appended to the HMMP.

Pre-construction / Construction Phase – Potential Effects

6.5.36. Given a significant proportion of the GI is embedded within the Proposed Development and will be delivered during the construction phase, benefits

resulting as a direct consequence of GI creation, such as a long-term enhancement in terms of quantity and quality of breeding habitat for amphibians, is considered to comprise a construction effect. The long-term significance of such impacts on IEFs is nevertheless likely to be influenced by the appropriateness of habitat management implemented during the operation of the site, as secured by the (embedded) HMMP and by phase-specific P-HMMPs.

Sites with a Statutory National Nature Conservation Designation

Oxford Meadow SAC

6.5.37. The pre-construction/construction phase of the Proposed Development is not expected to increase traffic flows on relevant sections of the A40 Northern By-pass Road or the A34 Western By-pass Road by more than screening criteria applied in accordance with Highways England guidance[63]. The SAC was nevertheless included within the Air Quality Assessment (AQA) detailed within Chapter 4: Air Quality and Odour following feedback received from Natural England during the Stage 2 consultations requesting this site to be included.

6.5.38. As detailed within Appendix 4.5, no exceedance of the 1% screening thresholds for annual mean nitrogen oxide NO_x, ammonia (NH_3), Nitrogen deposition or Acid deposition is predicted within the Oxford Meadows SAC during construction and therefore no adverse effects are anticipated on the SAC as a result of air quality changes from construction traffic (**neutral effect**).

Ardley Cutting and Quarry SSSI

6.5.39. The Ardley Cutting and Quarry SSSI is designated for both its ecological value and its geological interest (Jurassic rock exposures). Reference should therefore also be made to Chapter 11: Ground Conditions which considers potential impacts on the geological features of this SSSI.

6.5.40. Construction of the rail cuttings and sidings to connect the Main Site to the Chiltern Main Line rail track, and construction of the Ardley Bypass over the railway line, will result in some localised habitat losses from within the boundary of the Ardley Cutting and Quarry SSSI, from the construction zone within adjacent areas, and as a result of shading from the new bridge across the SSSI. Works will necessitate the removal of c.2.89ha of SSSI habitat

[63] Highways England 2024. *Design Manual for Roads and Bridges* LA 105 Air Quality.

(c.7.2% of the SSSI area) comprising a mix of predominantly mixed scrub and bramble scrub (1.13ha, representing 39.1% of SSSI habitats removed), other neutral grassland (0.86ha), lowland calcareous grassland (0.49ha), lowland meadow (0.06ha), broadleaved woodland (0.11ha), ponds (non-priority habitat) (0.08ha), and bare ground/built linear features (0.02ha). A narrow strip of arable land totalling 0.15ha is also encompassed within the SSSI boundary and will be removed as part of the proposed works.

6.5.41. There will additionally be some small-scale loss of habitat connectivity between the SSSI and adjacent habitats, mainly in the vicinity of the Ardley Bypass bridge. Habitats removal from this area would be localised and low magnitude and will primarily affect areas of established and encroaching scrub.

6.5.42. Construction works within the SSSI designation area will not directly impact SSSI habitats outside of the limited areas above.

6.5.43. The potential to provide material biodiversity gains within the cutting component of the Ardley Cutting and Quarry SSSI are significantly constrained by the necessary prohibitive (safety related) limitations to access along the active rail track. A beneficial consequence of the proposals however is that the excavation of the new railway cutting in the northwest of the site will expose new calcareous subsoils suitable for the establishment of new priority calcareous grassland habitat and hence additional habitat connectivity.

6.5.44. Unmitigated the habitat loss from the SSSI will result in a low magnitude reduction in the extent of SSSI habitats present and corresponding fragmentation of retained habitats within and adjacent to impacted sections of the SSSI. Any net loss of qualifying or complimentary habitat from the SSSI is considered to undermine the conservation status of the designated site, resulting in a **permanent,** low magnitude but **significant adverse** effect on a receptor of **national** importance.

6.5.45. The local hydrological regime is likely to alter as a result of alteration to the rate of run-off from hard-standing surfaces of the SRFI, and creation of the new cutting. Significant alterations in run-off and groundwater levels may have ecological consequences through an alteration in important hydrological processes, such as groundwater availability, deposition and erosion. A long-term and permanent alteration to the hydrological regime i.e. water quantity and/or water quality, has the potential to alter the structure and composition of the habitat communities noted within the SSSI citation.

6.5.46. The hydrological assessment detailed in ES Chapter 9: Water Environment notes that groundwater for the Site flows southeast, and that the proposed drainage strategy, including SuDS as embedded mitigation, will be implemented such that the quality and rates of water run-off will not be significantly altered, i.e. retained at existing greenfield levels. It is also pertinent that the Application Site is predominantly underlain by a bed of relatively permeable White Limestone (see Chapter 11: Ground Conditions). Any residual hydrological impacts of the Proposed Development on retained SSSI habitats resulting from construction of the development will therefore have a **permanent, not significant adverse** effect. Given the presence of the existing rail track cutting this impact is expected to be localised to habitats within the southern rail embankment only and will not impact those on the northern embankment or within Ardley Wood.

6.5.47. Gagle Brook and a tributary of Padbury Brook each cross the SSSI via existing culverts underneath the rail track and associated embankments. Each watercourse section within the SSSI boundary is fully culverted however, with the culverts also extending through adjacent habitats, therefore there is no pathway for pre-construction/construction impacts to these watercourses to influence habitats within the SSSI (**neutral impact**). Potential impacts acting on brook habitats outwith the SSSI are discussed in the Habitats section below.

6.5.48. Physical damage to retained SSSI habitats from works vehicles or other machinery or via the compaction of soils can lead to direct mortality or alter the species and structural diversity of vegetation. Embedded mitigation in the form of appropriate, industry standard precautionary working methods as stipulated within the CEMP will avoid or otherwise minimised the potential for direct construction impacts. In the event physical damage to retained SSSI habitat occurs this would likely be localised and low magnitude and represent a **permanent, not significant adverse** effect as a result of the construction phase.

6.5.49. Potential indirect effects that could occur during construction include dust deposition onto priority habitats within Ardley Cutting and Quarry SSSI and accidental pollution events, pollution via surface run-off. These pathways have the potential to negatively affect the conservation value of the priority features of the SSSI. Dust pollution for example can have a direct impact on vegetation by blocking sunlight from the leaves of plants, blocking stomata, and affecting a plant's ability to photosynthesise. An unmitigated increase in

airborne dust, particularly during periods of dry weather, can therefore damage vegetation and potentially affect associated fauna.

6.5.50. The dust deposition zone of influence that might be reasonably assumed to lead to adverse ecological effects is typically considered to extend 50m from the area of construction (or 50m of the routes used by works vehicles on the public highway)[64]. This radius from the development footprint encompasses the two sections of SSSI directly impacted by creation of the new railway links and all intervening SSSI habitats along the south-western existing embankment but not extending to the north-eastern embankment or into Ardley Wood. The precautionary working methods detailed within the CEMP will mitigate the potential for dust deposition onto sensitive SSSI habitats as to a **temporary, not significant adverse** effect.

6.5.51. Potential impacts arising due to pollution events will similarly be mitigated via the implementation of appropriate precautionary working procedures as detailed within the CEMP. As such, potential impacts to the SSSI arising due to pollution or surface run-off will be **temporary** and **not significant adverse**.

6.5.52. The Air Quality Assessment (AQA) reported within Chapter 4: Air Quality and Odour predicted exceedances of the identified screening thresholds for key airborne pollutants within Ardley Cutting and Quarry SSSI. The dispersion and deposition model outputs have been reviewed with reference to the spatial distribution of sensitive habitats within the SSSI to provide an informed ecological interpretation and to identify any potential significant ecological impacts resulting from the Proposed Development.

6.5.53. The SSSI qualifying features and habitat sensitivities listed in Table 6.10 were identified from the Air Pollution Information System (APIS) website[65]. Where a range of critical load values is provided this reflects the variation in the level at which damaging impacts can occur in different ecosystems, for example due to differences in rainfall, soil pH, management, nutrient limitation, and also the robustness of underlying empirical data. As a precautionary measure the AQA referenced the lower end of the proposed critical load range for each listed habitat.

[64] Institute of Air Quality Management, 2024. *Guidance on the Assessment of Dust from Demolition and Construction*. January 2024. Version 2.2.
[65] https://www.apis.ac.uk/

6.5.54. Predicted future deposition rates for NO_X, NH_3, Nitrogen and Acid were derived for selected receptor locations along a transect that extends up to 200m from each affected road that crosses the SSSI. The receptor locations are listed in Chapter 4: Air Quality and Odour: Appendix 4.4, Table 4.4.6, and predicted concentrations of each during the peak' year of the construction programme (2028) are listed in Tables 4.5.25 to 4.5.28 within Appendix 4.5: Air Quality Modelling Results and Odour Survey Results.

Table 6.10: Air Quality Critical Loads / Levels – Ardley Cutting and Quarry SSSI

Ardley Cutting and Quarry SSSI Qualifying / Notable Site Features	**Sensitive to N Y/N**	**Sensitive to Acid Y/N**	**Bryophytes or Lichens Integral Y/N/P (possible)**	**Critical Level - NH3 (g/m^3)**	**Max/Min Critical Load - N Deposition (kg N/ha/yr) Designated sites**	**N Deposition Critical Load used in AQA (kg N/ha/yr)**	**Max/Min Critical Load - Acid deposition (keq/ha/yr) (APIS66)**	**Acid Critical Load used in AQA (keq/ha/yr)**
Bromus erectus - Brachypodium pinnatum Lowland calcareous grassland	Y	Y	N	3	10-20	10	0.856-4.856	1
Bromus erectus Lowland calcareous grassland	Y	Y	N					
Duke Of Burgundy *Hamearis lucina*	-	-	-		-	-	-	
Invertebrate assemblage	Y	Y	-		-	-	-	

6.5.55. Ardley Cutting and Quarry SSSI is considered to be in 'unfavourable-recovering' condition[67], however air quality issues are not identified by Natural England as a known pressure to the SSSI[68], with the only pressure highlighted being the encroaching scrub that is subject to management by the landowner (Network Rail) via removal of sections on a rotational basis.

6.5.56. It is relevant to note that the majority of the SSSI does not support the qualifying habitats for which the SSSI was designated, i.e. CG3 - *Bromus erectus* lowland calcareous grassland or CG5 - *Bromus erectus* - *Brachypodium pinnatum* lowland calcareous grassland, with the Ardley Wood component of the SSSI supporting woodland, scrub, rough grassland

[66] Air Quality and Pollution Service. Available at: https://www.apis.ac.uk
[67] https://designatedsites.naturalengland.org.uk/SiteFeatureCondition.aspx?SiteCode=s1000903&SiteName=Ardley%20Cutting%20and%20Quarry%20SSSI
[68] https://designatedsites.naturalengland.org.uk/SitePressures.aspx?SiteGuid=30af95e3-5a50-e411-a6ba-000d3a2004ef&SiteCode=S1000903&SiteName=Ardley%20Cutting%20and%20Quarry%20SSSI

and seasonal ponds, and the majority of the cutting supporting scrub, and to a lesser extent broadleaved woodland, other grassland communities, tall forms and a seasonal pond (see Figures 1 to 5 within Appendix ES6.2: Ardley Cutting & Quarry SSSI Botanical Survey Report). These habitats are not designated SSSI features and furthermore are likely to have a buffering effect on any air quality impacts acting on the more sensitive calcareous grassland.

6.5.57. There is currently no guidance regarding accepted thresholds for the assessment of magnitude of air quality effects on ecological receptors or on ecological significance thresholds. With respect to the assessment of ecological effect significance, it is important to note that the 1% screening threshold referenced in Chapter 4: Air Quality and Odour is not an effect threshold, and that the magnitude of impact that may result in a significant ecological effect can be influenced by factors including the baseline conditions and sensitivity of the relevant habitat/feature.

6.5.58. As identified by the AQA, all peak construction NO_x concentrations within the Ardley Cutting and Quarry SSSI that also exceed the 1% threshold will remain below the annual mean critical Level of 30.0µg/m^3 (see Table 4.5.25 within Appendix 4.5). All annual mean NH_3 concentrations that also exceed the 1% threshold (see Table 4.5.26) within the SSSI are also predicted to remain below the annual mean critical Level for ammonia of 3.0 µg/m^3. No significant construction effect is therefore anticipated on the Ardley Cutting and Quarry SSSI as a result of NO_x and NH_3, and potential impacts from these air pollutants are considered **neutral**.

6.5.59. With regard to Nitrogen deposition, the background rates indicate that background levels are already in exceedance of the critical load (10kg N/ha/yr) across all receptor locations along the modelled transect (see Table 4.5.27). Construction activities are predicted to result in some small increases in deposition rates (0.1 to 0.41kg N/ha/yr) along a c.290m section of the SSSI that extends from the west of the B430 to the point at which the Ardley bypass will cross over the SSSI corridor (receptors ECO1_C_10 to ECO1_F_50) that will exceed the 1% screening level.

6.5.60. The Acid deposition background levels are also in exceedance of the critical load (1.0 keq/ha/yr) across all receptor locations of the modelled transect (see Table 4.5.28). Some small increases are predicted in background Acid deposition levels within the SSSI (ranging from 0.01 to 0.04 keq/ha/yr) along a c.40m length between 10m and 50m northwest of the B430 road crossing, and a c.60m length extending from 10m to 70m southeast of the B430 (see Table 4.5.28).

6.5.61. Given the proportionately very small increases in Nitrogen deposition and Acid deposition rates modelled relative to existing background levels the impact of the effect on the SSSI will be **temporary**, **neutral** to **not significant adverse** and will not impact the conservation status of the site.

Other Statutory Designated Sites

6.5.62. There will be no direct loss of habitat from any other statutorily designated site of nature conservation interest (European Sites, SSSIs or LNRs) as a result of the Proposed Development.

6.5.63. Pre-construction/construction works could indirectly impact off-site statutory designated sites via a hydrological pathway via either Gagle Brook or Padbury Brook. The Gagle Brook flows into Wendlebury Meads and Mansmoor Loses SSSI, located 6.3km to the south of the proposed crossing point of the Middleton Stoney Relief Road and 10km downstream of this location, whereas Padbury Brook feeds into the River Great Ouse, which flows through Stevington Marsh SSSI, but at a location 50km from the Application Site (straight line distance) and over 100km downstream.

6.5.64. Given the significant intervening distances to the closest statutory designated sites of nature conservation interest, and the implementation of embedded mitigation as outlined in paragraphs 6.5.14 to 6.5.18 above, any accidental pollution events to local watercourses during pre-construction/construction would result in impacts of negligible magnitude and **neutral** significance to the sensitive habitats of Wendlebury Meads and Mansmoor Loses SSSI and Stevington Marsh SSSI or any more distantly located statutory sites.

6.5.65. The statutory designated sites listed within Table 6.11 are located within the 200m of the affected road network and were included within AQA detailed in Chapter 4: Air Quality and Odour. The magnitude of the distance separating the Application Site from all other statutory sites of nature conservation interest is considered sufficient to ameliorate the risk of any indirect impacts during construction. For included sites impacts were predicted at selected receptor locations along transects extending up to 200m from affected roads. The locations of each of the modelled ecological receptors are listed in Chapter 4: Air Quality and Odour: Appendix 4.4, Table 4.4.6.

6.5.66. To inform the assessment of potential significant effects the qualifying/ notable features of each site were assessed in terms of the vulnerability of their component habitats with reference to the habitat-specific critical loads

for each air pollutant. As above for Ardley Cutting and Quarry SSSI, where a range of critical load values is provided the AQA referenced the lower end of this range for each site or listed habitat as a precautionary measure.

Table 6.11: Other Statutory Designated Sites Included in AQA

Site Name	Distance from Application Site	Qualifying/Notable Site Features	Sensitive to N Y/N	Sensitive to Acid Y/N	Bryophytes or Lichens Integral Y/N/P (possible)	Critical Level - NH3 (g/m^3)	Max/Min Critical Load - N Deposition	N Deposition Critical Load used in AQA (kg N/ha/yr)	Max/Min Critical Load - Acid deposition (keq/ha/yr) (APIS[69])	Acid Critical Load used in AQA (keq/ha/yr)
Oxford Meadows SAC	13.8km 10.8km from M40 J9 works	Lowland hay meadows - *Alopecurus pratensis*, *Sanguisorba officinalis*	Y	Y	N	3	10-20	10	1.071-5.071	1
		Creeping marshwort *Apium repens*	Y	Y	-					
Ham Home-cum-Hamgreen Woods SSSI	12.40km	*Fraxinus excelsior - Acer campestre - Mercurialis perennis* woodland	Y	Y	Y	1	15-20	10	0.357-2.87	1
		Quercus robur - Pteridium aquilinum - Rubus fruticosus woodland	Y	Y	Y					
		Wood white *Leptidea sinapis*	-	-	-	-	-	-	-	
		White-letter hairstreak *Satyrium w-album*	-	-	-	-	-	-	-	
		Black hairstreak *Strymonidia*	-	-	-	-	-	-	-	

[69] Air Quality and Pollution Service. Available at: https://www.apis.ac.uk

Site Name	Distance from Application Site	Qualifying/Notable Site Features	Sensitive to N Y/N	Sensitive to Acid Y/N	Bryophytes or Lichens Integral Y/N/P (possible)	Critical Level - NH3 (g/m^3)	Max/Min Critical Load - N Deposition	N Deposition Critical Load used in AQA (kg N/ha/yr)	Max/Min Critical Load - Acid deposition (keq/ha/yr) (APIS[69])	Acid Critical Load used in AQA (keq/ha/yr)
		pruni								
Long Herdon Meadow SSSI	7.84km	*Alopecurus pratensis - Sanguisorba officinalis* grassland	Y	Y	N	3	10-20	10	1.071-5.071	1
Shabbington Woods Complex SSSI	11.37km	*Cynosurus cristatus - Centaurea nigra* grassland	Y	N	N	3	10-20	10	1.071-5.071	1
		Invertebrate assemblage	Y	-	-	-	-	-	-	
		Black hairstreak *Strymonidia pruni*	-	-	-	-	-	-	-	
		Brown hairstreak *Thecla betulae*	-	-	-	-	-	-	-	
Wendlebury Meads and Mansmoor Closes SSSI	4.67km	*Cynosurus cristatus - Centaurea nigra* grassland	Y	Y	N	3	10-20	10	1.071-5.071	1

6.5.67. None of the ecological sites listed within Table 6.11 will be subject during construction to any exceedances of the 1% screening threshold and of the associated critical load/critical Level for any of the airborne pollutants assessed. As such any construction impacts to these sites as a result of air quality will be **neutral to not significant adverse**.

Non-Statutory Sites of Nature Conservation Value

6.5.68. In the absence of additional mitigation, the potential construction impacts to non-statutory sites comprise habitat loss, and physical damage to retained vegetation and soils.

6.5.69. There will be no direct habitat loss from the Upper Heyford Airfield LWS, and the current high level security fencing will prevent any indirect impacts from damage to retained vegetation and soils. The creation of areas of calcareous grassland and lowland meadow adjacent to the LWS and provision of a continuous landscape corridor along the western boundary of the Application Site as part of the embedded green infrastructure will enhance habitat connectivity alongside areas of calcareous grassland and tree groups within the LWS. As such a **permanent, not significant beneficial effect** is anticipated on this ecological receptor of **county** level importance.

6.5.70. There will be no direct habitat loss from Ardley Fields Quarry LWS, and with the implementation of appropriate precautionary working methods throughout pre-construction and construction as specified within the CEMP, no significant indirect impacts such as via noise disturbance, physical damage to retained vegetation, or pollution events are anticipated. Consequently, the pre-construction/construction phase will result in a **neutral** effect to this LWS.

6.5.71. There will be some small-scale habitat loss from Ardley Road Verge Nature Reserve that results from the routing of a footpath / cycle path along a defunct pull-in road off the B430, and the replacement of a small section (c.160m^2) of shrub habitat at the northern edge of this non-statutory site with a c.9m wide clearing maintained with native grassland to form a pedestrian access to a realigned footpath within the Main Site. The roadside grassland supporting meadow clary is located outside the Application Site. As such the habitat losses would be localised and low magnitude and will not result in the removal of any meadow clary or undermine the conservation status of the Ardley Road Verge Nature Reserve.

6.5.72. Adjacent green infrastructure creation will include establishment of species-rich grassland that will replace the existing intensively managed arable land that currently surrounds the road verge reserve, providing ecologically valuable habitats that complement and buffer those within the reserve, and provide opportunity for the meadow clary population to spread into surrounding areas. The embedded mitigation comprising GI creation in conjunction with precautionary working methods as described within the CEM/P-CEMP will therefore deliver a **neutral** to not **significant beneficial** effect on this **county** level site.

6.5.73. It is anticipated that there will be a very small loss of lowland deciduous woodland from The Heath pDWS associated with the rerouting of a public right of way through an existing clearing. The development design has

sought to reduce this as far as possible. Habitat removal required as part of the Proposed Development therefore has potential to result in **permanent, not significant, adverse effect** at a **county** scale.

6.5.74. Ardley Fields Ponds East LWS, Ardley Fields Ponds West LWS, Trow Pool and Stoke Wood LWS and the Trackway adjacent to The Gorse pDWS or Kennel Copse pDWS are each located sufficiently distant from the Proposed Development that no habitat loss or direct physical damage to retained vegetation and soils will occur, and the pre-construction / construction phase will result in a **neutral** effect to these sites.

6.5.75. The proposals in the vicinity of the areas of ASNW adjacent to the Application Site (Kennel Copse and Burntwood Copse) solely comprise the establishment of further broadleaved woodland planting and native grassland creation. As such no significant alteration to the existing hydrological regime of this site is anticipated and any residual adverse effects of the Proposed Development on ASNW habitats as a result of altered hydrology will have **neutral** significance.

6.5.76. Where non-statutory sites coincide within the 50m radius potential zone of influence of dust deposition, adherence to the dust management procedures specified within the CEMP will ensure any corresponding effect is likely to low magnitude and temporary such that the composition of associated habitats does not materially alter, resulting in an impact of **not significant adverse** significance.

6.5.77. The non-statutory sites listed in Table 6.12 are located within the 200m of the affected road network and were included within the AQA. As the APIS website does not provide site-relevant critical loads for non-statutory designated sites for nitrogen or acid, appropriate habitat-based nitrogen deposition critical loads were therefore identified via reference to site citations for equivalent habitats, and ammonia critical levels from the qualifying habitats present and their likelihood that these support important bryophyte or lichen communities. Neutral and calcareous grassland, lowland woodland and watercourse habitats for example are considered unlikely to support important bryophyte or lichen communities, hence a 3.0µg/m^3 critical level for ammonia was applied to these habitats, whereas sites supporting ancient woodland have as a precautionary approach been assigned the lower critical level of 1.0µg/m^3 on the basis that they may support ammonia-sensitive lichen communities. A precautionary 10kg N/ha/yr lower critical

load was applied for ancient woodland sites, in accordance with Woodland Trust guidance[70].

6.5.78. None of the non-statutory ecological sites listed within Table 6.12 will be subject during construction to any exceedances of the 1% screening threshold and of the associated critical load/critical Level for any of the airborne pollutants assessed. As such any construction impacts to these sites as a result of air quality will be **neutral**.

Table 6.12: Non-Statutory Sites Included in Air Quality Assessment

Site Name	Distance from Application Site	Qualifying/Notable Site Features	Sensitive to N Y/N	Sensitive to Acid Y/N	Bryophytes or Lichens Integral Y/N/P (possible)	Critical Level - NH3 (g/m^3)	Max/Min Critical Load - N Deposition	N Deposition Critical Load used in AQA (kg N/ha/yr)	Max/Min Critical Load - Acid deposition (keq/ha/yr) (APIS[71])	Acid Critical Load used in AQA (keq/ha/yr)
Ardley Fields Quarry LWS	Adjacent to and slightly within the north easternmost extent of the Main Site	Restored quarry supporting improved grassland, rough grassland, young planted trees, species-rich grassland, ponds and wet ditches.	Y	Y	P	3	-	10	0.856-4.856	1
Trow Pool LWS	Adjacent to Site	Two shallow ponds supporting rare bottle sedge *Carex rostrata*.	Y	Y	P	3	-	10	0.142-10.866	1
Graven Hill Wetlands Proposed Cherwell DWS	1.5km	Seasonal wetland supporting a varied bird assemblage and great crested newt.	Y	Y	P	3	-	10	0.714-2.314	1
Burntclose	Adjacent to	Ancient woodland	Y	Y	P	1	-	10	0.357-	1

[70] Woodland Trust 2019. *Assessing Air Pollution Impacts on Ancient Woodland – Ammonia*. Available at: https://www.woodlandtrust.org.uk/media/1687/ammonia-impacts-on-ancient-woodland.pdf
[71] Air Quality and Pollution Service. Available at: https://www.apis.ac.uk

Site Name	Distance from Application Site	Qualifying/Notable Site Features	Sensitive to N Y/N	Sensitive to Acid Y/N	Bryophytes or Lichens Integral Y/N/P (possible)	Critical Level - NH3 (g/m^3)	Max/Min Critical Load - N Deposition	N Deposition Critical Load used in AQA (kg N/ha/yr)	Max/Min Critical Load - Acid deposition (keq/ha/yr) (APIS[71])	Acid Critical Load used in AQA (keq/ha/yr)
Copse	Site								2.87	
Digging Copse	0.40km	Ancient woodland	Y	Y	P	1	-	10	0.357-2.87	1
Stoke Little Wood	1.27km	Ancient woodland	Y	Y	P	1	-	10	0.357-2.87	1
Twelveacre Close	1.71km	Ancient woodland	Y	Y	P	1	-	10	0.357-2.87	1
Unnamed AW adjacent to Tritax Park Oxford	0.07km from M40 J9 highways works	Ancient woodland	Y	Y	P	1	-	10	0.357-2.87	1
Meizen Copse	0.50km from M40 J9 highways works	Ancient woodland	Y	Y	P	1	-	10	0.357-2.87	1
Unnamed AW adjacent to Rowles Farm Solar Park	2.94km from M40 J9 highways works	Ancient woodland	Y	Y	P	1	-	10	0.357-2.87	1
Unnamed AW adjacent to Magnolia Park	7.57km from M40 J9 highways works	Ancient woodland	Y	Y	P	1	-	10	0.357-2.87	1

Conservation Target Areas (CTAs)

6.5.79. The Proposed Development has been designed to avoid or otherwise minimise impacts to priority CTA woodland, hedgerow and grassland habitats where possible. Furthermore, in the absence of additional mitigation the green infrastructure will provide new habitats comprising c.2.61ha of lowland

meadow, 11.89ha of modified grassland, 100.37ha of other neutral grassland, 4.77ha of mixed scrub, 5.87ha of lowland mixed deciduous woodland, 54.20ha of broadleaved woodland, 0.47ha of priority habitat pond habitats, 7.85ha of swales and SuDs, 13.92km of species-rich native species hedgerow and c.480 individually planted trees, all predominantly within the boundary of the CTA. In the absence of additional mitigation habitat loss would therefore have a **permanent, not significant adverse effect** on the **county** value CTA.

6.5.80. There will be no direct habitat loss from the Tusmore and Shelswell Park CTA given the intervening distance between it and the Proposed Development. Furthermore, with the implementation of appropriate precautionary working methods throughout site clearance and construction as specified within the CEMP, no significant indirect impacts are anticipated. Consequently, the pre-construction/construction phase will result in a **neutral** effect on the CTA.

6.5.81. The Ardley and Upper Heyford CTA was not included as a separate site within the AQA, however sections of the CTA located within 200m of the affected road network encompasses Ardley Cutting and Quarry SSSI, Ardley Fields Quarry LWS and Trow Pool LWS that as outlined above. On the basis of the air pollutant deposition rates modelled across these receptors any construction impacts to the CTA as a result of air quality are also anticipated to be **neutral to not significant adverse**.

6.5.82. The Tusmore and Shelswell Park CTA lies outside the 200m affected road network, hence air quality effects during construction are considered to have **neutral** impact on this CTA.

Other Sites

6.5.83. The magnitude of the distance separating the Application Site from all other non-statutory sites is considered sufficient to ensure that there will be no impacts to these features during construction.

Habitats

Direct Habitat Loss

6.5.84. Direct impacts involving habitat losses to accommodate the Proposed Development are anticipated as identified in the Table 6.13.

Table 6.13 Summary of Priority Habitat Loss Impacts in the Absence of Additional Mitigation/Compensation

(refer to Appendix ES6.9: Biodiversity Net Gain Assessment.

Ecological Receptor	Nature Conservation Value	Approx. Area / Length / Number		
		Lost or Impacted	Created	Total Retained + Created)
Lowland Calcareous Grassland	National	0.49ha	0ha	1.51ha
Lowland Meadow	National	0.06ha	2.61ha	3.17ha
Other neutral Grassland	Local	53.67ha	100.37ha	124.84ha
Lowland Mixed Deciduous Woodland	County	1.07ha	5.87ha	6.66ha
Other Broadleaved Woodland	Local	7.14ha	54.20ha	66.49ha
Arboriculture	Local	c.130 trees including tree groups	480 trees	Not quantified
Hedgerows	Local - County	11.77km	13.92km	30.10km
Watercourses (brook tributaries)	Local	0.27km to be culverted 0.77km to be re-aligned	1.52km 'other rivers and streams'; 1.26km ditches	4.52km 'other rivers and streams' (including 1.69km retained and 1.31km enhanced). 1.30km new ditches.
Waterbodies	Local	One waterbody impacted	0.47ha ponds, 7.85ha swales and SuDS	0.64ha ponds, 7.85ha swales and SuDS

6.5.85. The Proposed Development has been designed to avoid and retain larger areas of existing tree cover such as that around the Ashgrove farmstead, mature linear trees and internal tree groups within areas of open space and green corridors where possible and will retain a total of ca.13.77ha of woodland habitat (c.60.55% of existing), comprising: other broadleaved (12.29ha), lowland mixed deciduous (0.79ha), and non-priority woodland habitats: other mixed woodland (0.65ha) and other coniferous woodland (0.03ha). Some loss of broadleaved woodland and individual trees is unavoidable due to significant ground works and level changes required to enable viable built platforms and to enable the M40 J10 Highways Works and the construction of the Middleton Stoney Relief Road to proceed.

6.5.86. The GI includes new linear areas of woodland planting around the Main Site and along the new road corridors as part of the embedded mitigation. Further native woodland planting is proposed within the south of the Main Site and as a separate woodland block west of the B340 and Manor Farm Cottages. An area of lowland mixed deciduous woodland will be established adjacent to the off-site ancient woodland block within Burntclose Copse alongside Gagle Brook. In total over 60ha of new broadleaved woodland planting is proposed (54.28ha other broadleaved woodland and 5.9ha lowland mixed deciduous). The resulting effect would be a **permanent, not significant beneficial** on the overall woodland resource at a **local** to **county** scale.

6.5.87. Four trees within the Application Site displayed significant decay features, such as branch death and hollowing and as such were identified as veteran trees in accordance with the definition provided by the NNPS (2024) (see ES6.8: Arboricultural Assessment). Three of these (T150, T152 and T170) will be retained and appropriately buffered by the proposed green infrastructure, each with an enhanced root buffer equating to at least 15x the stem diameter, or 5m beyond the canopy, whichever is the greater, in accordance with industry guidance[72]. It is however necessary to remove T93, a NNPS veteran ash, to enable the development. A further twenty-seven trees scheduled for removal met the lower threshold to qualify as Irreplaceable Habitat as defined by the Biodiversity Gain Requirements (Irreplaceable Habitat) Regulations 2024. The proposals would not result in any loss of ancient woodland. As a nationally significant infrastructure project, this loss is considered justified as '*wholly exceptional*' in accordance with the NNPS (para 5.63)[73] (and also see footnote 62 of the NPPF), however in the absence of additional mitigation the effect will be **permanent,** and **significant adverse** on a **national** level receptor.

6.5.88. Approximately 11.77km of hedgerow is to be removed during the construction period, including sections of three of the 'important' hedgerows occurring within the Application site (H48, H50 and H65) totalling 260m in length. 13.92km new species-rich hedgerow is proposed however, of which 3.17km will include future standard trees throughout the length. As such an overall increase in the quantity and quality of hedgerow habitat will be

[72] Lonsdale, D. (Ed.). 2013. Ancient and other veteran trees: further guidance on management. London: The Tree Council. Read, H. 2000. Veteran Trees: A guide to good management. English Nature, Peterborough.
[73] The Planning Statement (Document 5.4) considers national policy issues and overall 'planning balance' issues.

delivered by the proposals, resulting a **not significant beneficial** effect at a **county** level.

6.5.89. The potential loss of historic hedgerows is considered separately within Chapter 10 and specifically within Appendix 10.6 Historic Landscape Assessment.

6.5.90. The realignment of the eastern and western stem tributaries of Ashgrove Brook within the Main Site to accommodate warehouse construction will impact c.490m of the eastern tributary and c.420m of the western tributary. These works will however result in a net gain in the length of watercourse habitat within the Application Site. The proposals will furthermore provide enhancement to c.1.32km of retained watercourse through the removal of adjacent agricultural management. Overall, an estimated 3.31km of the c.4.35km of existing watercourses on site, comprising a mix of brook channels, tributary ditches and culverted sections will be retained within the scheme. Furthermore, new watercourse channels comprising c.1.52km brook and c.1.26km ditch lengths will be created, representing a c.43.5% increase in overall open channel length within the Application Site.

6.5.91. The CEMP specifies precautionary working procedures to be followed during earthworks to prevent pollution from earthworks and other construction activities including: erosion control measures such as the avoidance of works close to water bodies including ditches during inclement weather; a requirement to cover temporary stockpiles where necessary to prevent runoff from flowing across exposed ground and becoming polluted with sediments, and sediment control measures including the use of cut-off ditches and silt traps to slow runoff and allow for settlement of sediment as close to the source as possible.

6.5.92. The realigned sections of the eastern and western stem tributaries of Ashgrove Brook will have open channels with the exception of any necessary culverts beneath access roads or the main highway. There will be an overall reduction in bank top encroachment along both sections as the adjacent land is taken out of agricultural use. Culverts are also proposed to be introduced along the main reach of Ashgrove Brook through the centre of the Main Site to permit creation of access roads. These will be located such that the invert level is below the existing bed level, to prevent impedance of water flow. In the absence of additional mitigation, the realignment works and culverts, in conjunction with an overall increase in watercourse length and reduction of encroachment will result in a **permanent, neutral** to **not significant beneficial** effect to Ashgrove Brook and its tributaries.

6.5.93. A short section (c.8m) of the Padbury Brook tributary to the northwest of the Main Site, located outwith, but upstream of the SSSI is required to be culverted to facilitate the SRFI infrastructure. This will result in a minor permanent loss of associated habitats from the watercourse. In the absence of additional mitigation, the installation of the culvert in combination with relevant embedded mitigation including the implementation of appropriate precautionary working methods as specified within the CEMP, the removal of existing habitats encroachment, and the diversification of the bank top vegetation via the establishment of species-rich grassland and native woodland, will result in a **permanent, neutral to not significant adverse** effect on the character of the tributary.

6.5.94. The construction of the Middleton Stoney Relief Road will cross the Gagle Brook at a single point northeast of Middleton Stoney along a section of the water channel that periodically dries up but that can also have approximate width 2.0m. In the absence of mitigation the permanent culverting of this section of the brook channel (presumed piped culverting) and associated tree loss and fragmentation of the riverine corridor due to construction of relief road will result in a **permanent, significant adverse effect** on the Gagle Brook corridor at a **county** level.

6.5.95. Retained and realigned watercourses including seasonally dry tributaries within the Application Site will be encompassed within the green infrastructure as follows:

- Tributary to Padbury Brook (south of rail track)
- The eastern and western tributary stems to Ashgrove Brook including realigned sections will be routed through continuous landscape corridors each of c.20m width.
- Ashgrove Brook will be buffered within a largely continuous habitat corridor within the Main Site of typical width 30-60m.
- Padbury Brook at J10: culverted under the road infrastructure but otherwise located within generous landscape buffers.

Habitat Fragmentation

6.5.96. Construction of the Middleton Stoney Relief Road and associated embankments will necessitate the removal of a c.0.41ha section of the

riverine woodland belt that borders Gagle Brook north of the B4030. The proposed brook crossing point is located c.175m north of an area of off-site ancient woodland (Burntclose Copse) encompassed within the wider woodland corridor.

6.5.97. The removal of woodland habitat required to enable road construction will introduce a permanent physical barrier to the movement of many floral and faunal species between the retained sections of woodland corridor, with this interruption to the movement of individuals (and propagules) potentially also influencing species assemblages within the wider woodland resource, including Burntclose Copse. Whilst the road construction works do not require any excavation adjacent to the exposed woodland edges, other potential disruptive impacts to retained sections of the woodland corridor include temporary disturbance of associated fauna during construction, an increase in edge effects including elevated light levels (both natural daylight and elevated artificial lighting) and increased exposure to wind along woodland margins, root damage (potentially resulting in tree loss), and wind throw.

6.5.98. Mitigation provision embedded within the scheme design was directed by the need for landscaping and by consideration of visual impacts as well as opportunities to ensure new and complementary habitat provision. It hence includes the creation of new woodland corridors extending both northwest and south from the Gagle Brook woodland corridor (approximately 1.40ha and c2.85ha respectively) and the establishment of further new biodiverse native broadleaved woodland planting that will buffer the brook corridor to the east and south of the crossing point and reduce the initial 60-85m width gap in the woodland belt to c.30m as this planting matures. Embedded mitigation will therefore reduce the extent of the permanent gap created within the Gagle Brook corridor, contribute to the enhancement of the retained woodland belt habitats, increase the extent of woodland habitat alongside and linking to the brook corridor, minimise or reverse edge effects, and facilitate the movement of woodland species between retained woodland habitat. These proposals align with opportunity areas identified within the Oxfordshire Local Nature Recovery Strategy (LNRS), specifically objectives PM 33 (Enhance Existing Woodlands) and PM 38 (Create Woodland) where gains from woodland creation and enhancement are prioritised.

6.5.99. In the absence of additional mitigation, the creation of an initial 60-85m wide gap in the existing woodland corridor (reducing to c.30m in the medium and long-term) during the construction phase will directly result in a local scale

significant adverse impact on woodland habitats associated with the established Gagle Brook corridor and contiguous ancient woodland in the short- to medium term, reducing to a non-significant adverse impact as the embedded landscaping matures. A **significant adverse** impact is anticipated on woodland floral and faunal species where these have limited dispersal capabilities, however a **negligible to not significant adverse** impact is anticipated for mobile species that can traverse such gaps, including many bird, bat and invertebrates.

6.5.100. Indirect impacts that could arise as a consequence of the fragmentation of the Gagle Brook corridor and associated road construction include the permanent alteration of hydrological regimes, for example as a result of drainage features significantly impacting natural sub-surface water tables and/or temporary impacts to retained habitats arising from accidental pollution events during construction, dust deposition or littering. Potential hydrological impacts are fully considered within the site-wide hydrological strategy as detailed within Chapter 9: Water Environment, and the potential for construction works to result in temporary impacts to retained habitats will be avoided or otherwise minimised as far as is practicable through strict adherence to the precautionary working methods as detailed within the CEMP, including, but not limited to: temporary surface water management (see Section 19 of the CEMP) and measures specifically to protecting biodiversity interests (CEMP section 21). Phase-specific P-CEMPS will be required to be informed by up-to-date tree survey data.

6.5.101. In the absence of additional mitigation, indirect construction impacts resulting from the Gagle Brook crossing including edge effects and influences operating via hydrological and pollution pathways will therefore have **neutral** to **not significant adverse** impact on associated habit and species and will largely be limited to edge effects at the new exposed woodland edges where these will not be buffered by new woodland planting.

Notable Plants

Basil Thyme

6.5.102. Basil thyme was recorded during detailed survey in August 2020 on a narrow plateau above the southern rail track embankment at a location between the proposed Ardley bypass bridge and the new rail track cutting connection north of the M40 bridge. This species was not however recorded present during an updating detailed survey of SSSI habitats completed in July 2025 that incorporated an expanded survey area along the southern rail track

embankment and also relevant sections of the northern embankment. No loss of basil thyme plants is therefore anticipated (habitat loss **neutral** effect).

6.5.103. The new rail cutting will be excavated to the south of the location of the 2020 record and there is scope at the detailed design stage to retain the basil thyme population *in situ*. If the location supporting basil thyme remains unaffected this will continue within the area of the SSSI owned and managed by Network Rail with no losses anticipated.

6.5.104. Earthworks would however necessarily be undertaken within the close vicinity, therefore there is potential for indirect impacts arising from dust deposition during construction. Given the implementation of appropriate dust control measures, as detailed within the CEMP and subsequent phase-specific 'P-CEMP's it is likely that any dust deposition would be sporadic, and rain events would periodically wash any dust deposition from the leaves. Consequently, in the absence of additional mitigation, any indirect impacts to basil thyme arising during construction would result in a **temporary, not significant adverse** effect at county level.

6.5.105. There will be potential for accidental pollution events during construction work which could result in localised adverse effects on vegetation, however the location of the basil thyme population (i.e., on a very narrow plateau immediately adjacent to the Order Limits boundary, and above the steep embankment down to the track) is such that it is considered unlikely that the area would be subject any accidental pollution event (**neutral** effect).

Meadow Clary

6.5.106. No loss of meadow clary plants is anticipated (habitat loss **neutral** effect).

6.5.107. The Proposed Development will however include construction works in close proximity to the retained plants within the Ardley Road Verge Nature Reserve therefore these will be vulnerable to construction impacts, specifically those arising via dust deposition. The effect will be **temporary**, and the application of appropriate working methods including dust suppression as detailed within the CEMP will reduce the significance to **not significant adverse**.

<u>Fauna</u>

<u>Badger</u>

6.5.108. Construction impacts to badgers as a result of the Proposed Development will include the loss and likely disturbance of setts and the loss of foraging habitat.

6.5.109. Works that will directly affect an active badger sett or are likely to disturb badgers occupying a sett would be completed under a Natural England licence (a legislative requirement and therefore embedded mitigation). A pre-commencement survey will be undertaken across the Application Site to confirm the status of setts at that time (of construction of relevant phases) and to document any fresh badger field signs within the construction zones and adjacent habitats. This data will inform the badger mitigation strategy for the Natural England licence documentation required to legitimise works to active setts including the sensitive timings of works. Under the terms of the Natural England licence replacement badger setts will be established within the on-site GI with badger tunnels and fencing to ensure that connectivity is maintained for this species between retained setts and foraging areas. The location of these features will be dependent on detailed design of the built development and landscape infrastructure and will likely be incorporated into the landscape bunding and screening planting in the vicinity of retained setts. Indicative locations for badger tunnels are provided in Appendix ES6.6.

6.5.110. The implementation of works under a Natural England licence will ensure that the local status of badgers is maintained within the Proposed Developments working area and that the impact to local badger clans due to partial loss or harm to sett networks would be **temporary** and of **not significant adverse** significance.

6.5.111. Furthermore, standard procedures will be applied by the Principal Contractor throughout site clearance and construction as set out within the CEMP to protect local badger from the risk of injury or harm to during construction. In addition, appropriate precautionary working methods are detailed with the CEMP including sensitive timings of works, careful storage of topsoil and materials, the closure or covering of trenches and other excavations overnight, and a method statement to avoid any disturbance to retained setts and ensure that local badger clans are protected from harm during construction (**neutral** effect).

6.5.112. Habitats to be created as part of the GI proposals will provide extensive suitable foraging habitat for badgers and opportunities for the creation of new setts. Tree and shrub planting will include native fruit bearing species such as crab apple *Malus sylvestris*, rowan *Sorbus aucuparia* and hazel.

6.5.113. The loss of a seasonal foraging resource currently provided by arable crops will result in a local level adverse effect that will be mitigated by the embedded mitigation measures comprising the provision of extensive GI as part of the Proposed Development. This will provide diverse foraging opportunities for badger including species-rich grassland, fruit trees and structural planting. Consequently, the construction phase will deliver a **neutral** to **not significant beneficial** effect for badgers at a local level.

Bats

6.5.114. Potential construction impacts to bats as a result of the Proposed Development comprise the loss or disturbance of roost sites and the loss of foraging habitat.

Bat Roost Sites

6.5.115. Surveys confirm the presence of common pipistrelle day roosts within buildings [redacted]

6.5.116. To avoid an offence under the Conservation of Habitats & Species Regulations 2017 (as amended) and ensure legal compliance the renovation of buildings supporting confirmed bat roosts will be completed in strict accordance with the terms of a European Protected Species Licence (EPSL) issued by Natural England, including any timing constraints and precautionary working methods that form part of the agreed method statement and identifying all works requiring the supervision of an appropriately licenced bat worker.

6.5.117. The terms of the licence will require provision of alternative roosting opportunities for local bat populations, likely in the form of multiple bat boxes at appropriate locations. The draft licence application submitted to Natural England for consideration during consultation pre-application proposes the following to mitigate for the loss of the day roosts:

- Seven Schwegler 2FN or similar bat boxes to be installed on suitable retained trees within close proximity of the original roosts.

- Provision of a minimum of 30 woodcrete/woodstone bat boxes such as Schwegler 2F, 2F with double front panel, 1FF and 1FW (hibernation box) boxes (or alternative, equivalent designs) throughout the site to provide an enhancement in terms of roosting opportunities for local bats.

6.5.118. Given the licencing process necessitates the implementation of precautionary working methods and provision of alternative roost sites to compensate for the loss of roosts, the effect of harm or disturbance to roosting bats within built structures would be no more than **temporary**, and **not significant adverse** at the **local** level.

6.5.119. In order to ensure legal compliance, final checks of mature trees will be undertaken by an appropriately licenced ECoW in advance of tree removal works, including aerial assessment and/or nocturnal survey as appropriate. Works to any confirmed tree roosts will proceed under the terms of an appropriate Natural England licence required to legitimise such works, including appropriate timing and safe working practices necessary to ensure that the risk to bats is minimised, and that alternative roosting sites are provided in the form of bat boxes erected on suitable trees in the vicinity and reflecting the nature of the roost identified. The effect of harm or disturbance to roosting bats within tree roosts would therefore be **temporary**, and **not significant adverse** at a **local** level.

Bat Foraging & Commuting Habitat

6.5.120. The severance of linear features used by commuting bats can hinder their access to favoured foraging areas and/or to roosts, resulting in fragmentation impacts. The removal of such features will limit available options for bats commuting between areas of retained habitat. However, the partial retention of linear features including along watercourses and the perimeter of the Main Site within the context of the GI provision is considered sufficient to maintain the function of linear habitats within the site. In addition, the phased nature of construction works will ensure that not all on-site habitat features will be affected at any one time.

6.5.121. The embedded GI established during each phase of construction will cumulatively provide far more suitable foraging and commuting habitat for bats than that lost, resulting in enhanced foraging opportunities and corridors of movement across the site. Consequently, in the absence of additional mitigation measures the construction phase will result in a **permanent non-**

significant beneficial effect on bat foraging and commuting habitats at a local level.

6.5.122. The Gagle Brook habitat corridor represents a strong linear feature through the local landscape regularly used as a commuting and foraging resource by many of the bat species recorded present during surveys (see Appendix ES6.3: Bat Report). As detailed above, construction of the Middleton Stoney Relief Road will sever this corridor at a single location, necessitating the removal of a c.75m section of woodland habitat at this point (though the embedded soft landscaping provision, including the creation of extensive broad habitat corridors along the new highway verges will reduce this gap to c.30m). The embedded GI will furthermore create new habitats links between adjacent Gagle Brook sections and the retained hedgerow network, hence will partially mitigate the loss of connecting linear habitat at a local level.

6.5.123. No road lighting is proposed along this stretch of the Middleton Stoney Relief Road.

6.5.124. Fragmentation of the Gagle Brook corridor at this point will disrupt the foraging and commuting behaviour of the local bat assemblage, and potentially prevent those species most closely associated with woodland edge habitats and closed vegetation structures such as barbastelle and brown long-eared bat from continuing to access parts of current home ranges. In the absence of additional mitigation, the proposed habitat removal is anticipated to result in a **permanent, adverse effect** on the local bat species assemblage, with the exception of *Pipistrellus*, *Nyctalus* and *Eptesicus* species as these will regularly cross gaps of this scale[74] (**neutral effect**).

Lighting

6.5.125. Bats can be deterred from using otherwise suitable habitat corridors by artificial lighting, particularly those species known to be light sensitive such as barbastelle and brown long-eared bat.

6.5.126. As detailed within Chapter 8: Lighting the lighting strategy (ES Appendix 8.1) has been designed in accordance with relevant guidance including that produced by the Bat Conservation Trust and Institution of Lighting

[74] Frey-Ehrenbold A., Bontadina F., Arlettaz R., Orbist M. K. 2013. Landscape connectivity, habitat structure and activity on bat guilds in farmland-dominated matrices. Journal of Applied Ecology 50: 252-261.

Professionals[75] to limit obtrusive light including light spill onto sensitive areas to a negligible level. All construction lighting will be subject to the agreed working hours, types of lighting to be used, and the British Standards to be followed, as defined within the CEMP (ES Appendix 2.3) and any additional considerations detailed within relevant subsequent P-CEMPs. Lighting specific commitments detailed within this embedded mitigation will therefore ensure that a network of dark (<0.2lux) habitat corridors are maintained, and hence that the impacts of construction lighting on habitats of importance for nocturnal and diurnal fauna including commuting and foraging bats are minimised. ES Chapter 8: Lighting confirms that the Gagle Brook corridor in the vicinity of Burntclose Copse will predominantly be maintained in darkness throughout construction, with any isolated instances of light spill comprising a **non-significant** adverse effect within the normal range of moonlight levels.

Great Crested Newts

6.5.127. The only GCN recorded present within the Application Site was a single adult female within a vertical-walled concrete water tank (P4) close to the Upper Heyford Airfield. This waterbody has 'below average' suitability to support breeding GCN (HSI score 0.55) and no evidence of attempted breeding behaviour, such as the presence of eggs was recorded within it. It is considered highly unlikely GCN could successfully breed within this waterbody, however P4 is assumed to be a breeding site in order to present a precautionary worst case for this assessment.

6.5.128. P4 will be lost as a result of the Proposed Development, however no other GCN breeding ponds will be lost. Onsite terrestrial habitats (hedgerows, scrub, woodland, and taller grassland habitats) provide potential cover and foraging opportunities for GCN and other amphibians during their terrestrial phase.

6.5.129. Of the four GCN metapopulations that use waterbodies within the surrounding areas at least one is using pond P51 within the J10 Highway Works Area and other ponds surrounding this area. Due to the presence of GCN there is a legal requirement to ensure that newts are not harmed or disturbed during construction. Site preparation works and construction will therefore be undertaken under the terms of a Natural England EPSL which

[75] Bat Conservation Trust and Institution of Lighting Professionals 2023. *Bats and Artificial Lighting at Night*. Guidance Note 08/23.

will form part of the embedded mitigation. To this end a full draft licence application has been provided to Natural England.

6.5.130. During construction there will be a temporary not significant adverse impact due to the short-term fragmentation of Metapopulation 2. Following completion of the construction phase all boundary temporary amphibian fencing (TAF) will however be removed and GCN will be able to move freely between habitats north and south of the railway line.

6.5.131. The EPSL will ensure that appropriate receptor areas are established within retained/ enhanced GI, with GCN safely translocated to these from the working areas ahead of commencement of site clearance, and that precautionary working methods are employed in accordance with an agreed method statement and are overseen by an Ecological Clerk of Works (ECoW).

6.5.132. The principles of the emerging GCN EPSL mitigation strategy are:

- A linear receptor site will be created along the western boundary of the Main Site to receive GCN from Metapopulation 1 to the west of the Main Site;
- A linear receptor area will be created within the eastern verge of the B430 and closely adjacent to the group of off-site ponds P8-P18 within Valencia land to receive GCN from Metapopulation 2 to the east of the Main Site;
- A receptor area will be created to the northeast of the new rail cutting close to the M40 to receive GCN translocated from Metapopulation 3 to the east and northeast of the Main Site;
- A fourth receptor site will be created in association with the J10 Highway Improvement Works alongside P51 to receive GCN from Metapopulation 4;
- Suitable terrestrial habitat within 250m of the breeding ponds is to be trapped out, with GCN translocated to the pre-prepared receptor areas;
- Where linear habitats such as hedgerows are to be impacted, these habitats will be trapped out over 250m to include the entirety of the hedgerow;
- Where trapping is required within the SSSI, due to the sensitivity of the habitats, any fencing required will be installed by hand;

- Trapping will involve a combination of temporary amphibian fencing and bucket traps to be installed around terrestrial habitats where there is a reasonable likelihood that GCN are present:
- Exclusion fencing will be installed at the site perimeters to prevent any GCN from accessing the site during ground works;
- Supervised dismantling of all suitable hibernation habitat will be conducted under licence following the completion of the trapping;
- The detailed design of highways will include tunnels, permanent amphibian fencing, dropped kerbs and/or off-set gulley pots as appropriate to minimise habitat fragmentation and avoid GCN becoming trapped in drains;
- Hibernacula and log pile features will be created in association with new ponds to provide suitable shelter; and
- Amphibian fencing will be moved back from the receptor areas at the earliest opportunity in order that newts are able to safely access any areas of newly created terrestrial habitat.

6.5.133. Implementation of the EPSL – including through measures implemented during construction (with EPSL measures incorporated into P-CEMPs) – and in conjunction with the creation of significant GI around and through the development will provide enhanced terrestrial habitats and habitat connectivity for GCN. Habitat creation to help deliver the mitigation requirements of the EPSL will include four new ponds along the western edge of the Main Site within a green corridor continuous with habitats populated by the Heyford Park GCN metapopulation. These and the series of SuDS basins to the south of the Main Site will incorporate stepped shallow areas and deeper central areas and will be planted with native wetland grassland and emergent species to provide suitable refuge and foraging opportunities for this species. In conjunction with the surrounding matrix of terrestrial habitats these waterbodies will provide new habitat connections around the Development Site that will facilitate colonisation by GCN and also gene-flow between local metapopulations, enhancing the long-term genetic resilience of these metapopulations.

6.5.134. **Temporary**, and **not significant adverse** fragmentation effects during the licensable works will be replaced by a **neutral** to **significant beneficial** effect at a **county level** once the fencing is removed from receptor sites and GCN are free to colonise the on-site GI.

Reptiles

6.5.135. Construction will result in some minor and localised loss of suitable reptile habitat, notably from the southern railway embankment and adjacent habitats along the northern boundary of the Main Site, and along hedgerows north of Ashgrove Farm. The resulting effects of habitat loss on local reptile populations during construction will be of low magnitude, **temporary, and not significant adverse** at a **local** level.

6.5.136. The CEMP specifies standard working procedures will be applied by the Principal Contractor throughout site clearance and construction that are appropriate to minimise the risk of mortality or harm to native reptiles such as via implementation of timing constraints and/or precautionary site clearance methods and habitat maintenance schedules. Furthermore, for each phase of the development any reptiles captured during the licensable (embedded) GCN trapping and translocation undertaking will similarly be relocated away from site clearance and construction works to pre-prepared receptor areas separated from development areas by temporary amphibian fencing (TAF). The pre-construction/construction phase will consequently result in a **neutral effect** on reptile species at a **local** level, replaced by a not significant beneficial effect as the embedded mitigation established and matures.

Birds

Habitat Loss – Breeding Birds

6.5.137. The loss of arable, grassland and hedgerow habitats from the Application Site as a result of construction will affect the farmland bird assemblage recorded present, including skylark and yellowhammer populations of county importance, and populations of up to local level importance of other species including corn bunting, linnet and stock dove that depend on these habitats for nesting and/or foraging. In addition, temporary loss of rough grassland is anticipated from the northern section of the landfill area noted to that support a relatively high density of skylarks (compared to neighbouring cereal cropland) and other farmland species including linnet and meadow pipit and smaller numbers of reed bunting. This loss will however be limited to a single breeding season after which the habitats are expected to revert to rough grassland.

6.5.138. Given the phased nature of works, not all on-site habitat features will be affected at any one time. Furthermore, the delivery of the embedded green infrastructure (also phased) will provide some limited alternative nesting and

foraging habitats comprising a mix of other neutral grassland, scrub, woodland stands and individual trees suitable to support the generalist bird species that largely inhabit the hedgerow network and woodland, including the locally important song thrush, mistle thrush and dunnock. Such species will experience a **short- to medium-term not significant adverse effect d**ue to localised habitat loss during the construction phase, however as the shrub and tree planting provided as the embedded mitigation matures this will result in a long-term **not significant beneficial effect** at a local level.

6.5.139. In the absence of additional mitigation however the proposals will reduce nesting opportunities for the farmland bird assemblage recorded present including skylark, yellowhammer, grey partridge and corn bunting, resulting in a temporary **significant adverse** effect on such species for the duration of the landfill works, reducing to a **not significant adverse** effect thereafter.

6.5.140. The loss of some buildings during construction from within the Main Site and renovation of the remainder will in the absence of specific mitigation result in an adverse effect on the bird species that preferentially use built structures for nesting. These include the locally important barn owl, house sparrow and kestrel. These species will additionally be impacted by the loss of grassland and field margins for foraging. Habitat loss and modification will therefore result in a **permanent not significant adverse effect** on these species at a **local** level.

6.5.141. The retention of all waterbodies with the exception of the concrete tank (P4) will result in a **neutral** effect on the breeding bird assemblage recorded in association with aquatic habitats.

6.5.142. Due to the scale and relatively long period over which construction will be undertaken, the potential exists for ground nesting bird species to opportunistically nest on cleared areas during the construction phase. Periodic checks will therefore be undertaken during the breeding season (March to September inclusive) by a suitably experienced ecologist / ECoW as specified within the CEMP. Any nests discovered would be protected by a ‘buffer zone’ of an appropriate distance in line with the bird’s status under the Wildlife and Countryside Act 1981 (as amended) to avoid direct impacts to active nest sites and ensure a **neutral** impact.

Habitat Loss – Wintering Birds

6.5.143. Skylark, yellowhammer, golden plover, corn bunting and reed bunting currently overwinter within the Application Site in numbers important at

'county' scale. Skylark is a transitory species during winter, using a network of foraging habitats, and the Application Site likely forms only a portion of the winter foraging habitat for the recorded skylark population. In the absence of additional mitigation the removal of arable land and partial loss of grassland habitats would subject overwintering populations of the above species of **county** importance to a **significant adverse** effect.

6.5.144. For the other farmland specialist bird species and the more generalist species that inhabit the hedgerows, trees and woodland, including grey partridge, lapwing, meadow pipit, starling, song thrush, bullfinch and dunnock habitat loss and creation during construction will result in a local level **short-term not significant adverse** effect replaced by a **neutral** effect following green infrastructure establishment.

6.5.145. The impact on raptors including peregrine, red kite and merlin will most likely be **neutral** as these species cover large territories in winter and there is an abundance of alternative suitable arable and grassland habitats in the wider landscape. In addition, peregrine can adapt successfully to urban habitats.

Disturbance to Birds During Construction

6.5.146. Construction activities have potential to indirectly influence the behaviour and distribution of birds, such as via noise disturbance. Noise from neighbouring vegetation clearance, ground works and some construction activities for example can lead to avoidance of the immediate area by sensitive species, or to reduced breeding success, including nest desertion.

6.5.147. Given that habitats would largely be removed from within working areas prior to construction commencing, the effects of anthropogenic noise would predominantly be limited to retained habitats located outside of construction areas. Such habitats will likely not support species considered relatively sensitive to novel noise disturbance (for example golden plover, lapwing, barn owl, and short-eared owl) but would remain suitable to support a reduced assemblage of more adaptable species including common and widespread bird species often recorded in close proximity to development.

6.5.148. As detailed within the CEMP (and will be incorporated into each P-CEMP as appropriate) retained habitats close to proposed works areas or haul routes will be protected from inadvertent damage throughout construction in accordance with BS 5837: 2012 Trees in relation to design, demolition and construction – Recommendations.

6.5.149. Given the relatively low sensitivity of the bird assemblage remaining present throughout construction, it is considered that disturbance effects arising during construction activities will result in a **temporary not significant adverse** effect on bird assemblages at a **local** scale.

Invertebrates

6.5.150. The majority of habitats that will be removed during pre-construction and construction comprise intensively managed arable fields and grazed pasture considered unsuitable to support the priority butterfly species listed within the LNRS Species Priorities List and within the citation details for the Ardley Cutting and Quarry SSSI (dark green fritillary, Duke of Burgundy, brown hairstreak, small blue, white admiral and white-letter hairstreak). Smaller sections of unimproved calcareous and neutral grassland will however also be lost from within the SSSI, and the majority of the hedgerow network within the Application Site interior will also be removed, as will deadwood habitat associated with mature trees and grassland habitats favoured by many butterfly species and other invertebrates including deadwood specialists (saproxylic species).

6.5.151. The embedded green infrastructure will however ensure that the Application Site continues to provide areas of species-rich grassland and that hedgerow losses will be fully mitigated via the boundary structural planting. The establishment of grassland and structural planting adjacent to the SSSI corridor will furthermore buffer retained off-site SSSI habitats and enhance the setting of these by extending the coverage of complementary habitats of value to many of the priority butterfly species above and also a broad range of other invertebrates.

6.5.152. Deadwood habitats occur infrequently within the Application Site and are likely to be similarly distributed in association with mature trees/woodland, hedgerows and scrub habitats that are reasonably abundant within the surrounding landscape. The magnitude of loss of invertebrate habitats as a result of the construction process is therefore low, and likely to result in a **temporary not significant adverse** effect at a local scale reversing to a **neutral to not significant beneficial** effect as the green infrastructure establishes.

Otter

6.5.153. Given the poor quality of available foraging habitats and low water levels of on-site watercourses it is considered unlikely that otter will utilise the Application Site except on a very limited and infrequent basis.

6.5.154. Unmitigated the proposed culverting of the Gagle Brook underneath the Middleton Stoney Relief Road will introduce a c.30m long obstruction along the watercourse, fragmenting this corridor and hence obstructing the movement of otter and other terrestrial/semi-aquatic fauna along it.

6.5.155. Local level habitat fragmentation can also reduce access to shelter or to foraging and commuting habitat in the surrounding landscape. Within the context of the GI provision that will include buffering of watercourse sections with native tree, shrub and grassland habitats, habitat loss and modification will result in a **permanent not significant adverse** effect on otter at a local level.

6.5.156. Increased disturbance of riverine habitats including increased human presence and construction activity and associated noise and lighting could disrupt the use of foraging/commuting routes by otter and may lead to the temporary abandonment of habitat and/or reduced foraging efficiency. Otters are however a relatively wide-ranging species, with territories that may extend over 30km of watercourse, therefore these localised impacts are unlikely to undermine the conservation status of the local population. It is also considered otter would return to such habitats after completion of construction activities therefore any disturbance effect would be temporary and **not significant adverse** at a local level.

6.5.157. Standard procedures applied by the Principal Contractor as set out within the CEMP to protect local badger from the risk of injury or harm throughout site clearance and construction will also provide protection to otter from direct harm (**neutral** effect).

Hedgehog

6.5.158. Hedgehogs are a wide-ranging species, with individual male territories of 20-30 hectares. They are typically associated with woodland, scrub and hedgerow habitat. The majority of suitable habitats within the Application Site will be retained, with losses largely confined to hedgerow habitat. Whilst removal of suitable habitat may remove some corridors of movement used by hedgehog across the Application Site the retention of boundary habitats and corridors, in particular Ashgrove Brook, will maintain connectivity across the Application Site for hedgehog. The construction impacts are therefore

unlikely to undermine the conservation status of the local hedgehog population. Given the structural planting component of the embedded green infrastructure proposals and the standard procedures applied by the Principal Contractor as set out within the CEMP to protect notable fauna throughout site clearance and construction will in addition provide protection to any hedgehog present. Construction would therefore result in a short to medium-term **not significant adverse** effect due to habitat loss during the construction phase. As the shrub and tree planting provided as part of the embedded mitigation matures however this will result in a permanent **neutral effect** at a **local** level.

Polecat

6.5.159. If present within the Application Site polecat are likely to occur in low densities given the suboptimal suitability of on-site habitats (predominantly agricultural land, managed hedgerows and field margins). The removal of field boundary habitats may reduce polecat access to habitats in the surrounding landscape and therefore the availability of shelter or foraging opportunities. Increased human presence and construction activity, such as increased noise and lighting, may disturb polecat, particularly in close proximity to commuting routes. This disturbance may lead to the abandonment of habitat and reduced foraging efficiency. Habitat loss/modification and associated disturbance will therefore result in a temporary **not significant adverse** effect in the short-term. As the structural planting provided as part of the embedded mitigation matures this will result in a **neutral** effect at a local level.

Hazel Dormouse

6.5.160. Hazel dormouse is considered absent from the Application Site, however given legislative protection afforded to the species against capture, harm and disturbance under The Conservation of Habitats and Species Regulations 2017 (as amended), consideration is given as a precautionary measure to ensure the development avoids harm/injury to any individuals. It is considered there is a very low likelihood of any being present, but such an approach ensures legal compliance.

6.5.161. A non-licenced method statement for site preparation and vegetation clearance works within and adjacent to the Gagle Brook corridor is provided within the CEMP. This details appropriate precautionary working methods to ensure construction works avoid direct harm/injury to hazel dormouse,

resulting in a **neutral** effect on hazel dormouse, should the species be present on site.

6.5.162. The structural planting provided as part of the embedded mitigation will deliver net benefits for small mammal populations generally by establishing an increased diversity of planting and improved habitat structure and connectivity. This will improve the carrying capacity of potential dormouse habitats within the Application Site, therefore the construction phase will result in a **permanent non-significant beneficial effect** on hazel dormouse foraging and commuting habitats at a local level.

Non-native/Invasive Species

6.5.163. Construction activities within the Proposed Development have potential to result in the spread of invasive non-native species, notably signal crayfish, into areas beyond their current distribution.

6.5.164. This risk is addressed via appropriate precautionary working procedures detailed within the CEMP including thorough inspection of materials removed from watercourse banks *in situ* and the washing of vehicles and other equipment will result in a **neutral** construction effect with regard to this species.

Summary of Construction effects

6.5.165. Table 6.14 summarises the likely construction phase effects with the implementation of the embedded mitigation including standard precautionary working methods as detailed within the CEMP, but in the absence of additional mitigation.

Table 6.14: Construction Phase Effects

Ecological Receptor / Ecological Importance	**Summary of Effect**	**Level of Effect**
Oxford Meadows SAC **International Level**	Degradation of habitats from air pollution, specifically airborne NOX, NH3, Nitrogen deposition and Acid deposition generated by construction traffic	Neutral
Ardley Cutting and Quarry SSSI **National Level**	Direct loss of calcareous grassland/neutral grassland/lowland meadow/scrub	Permanent **significant adverse**
	Degradation of habitats via hydrological pathways: surface water/groundwater	Permanent, not significant adverse

Ecological Receptor / Ecological Importance	Summary of Effect	Level of Effect
	Degradation of habitats via hydrological pathways: Gagle Brook, Padbury Brook	Neutral
	Physical damage to SSSI habitats	Permanent, not significant adverse
	Degradation of habitats from dust generated by construction traffic.	Temporary, not significant adverse
	Indirect impacts: noise, damage, or pollution events	Temporary, not significant adverse
	Degradation of habitats from air pollution generated by construction traffic, specifically airborne NO_X and NH_3	Neutral
	Degradation of habitats from air pollution generated by construction traffic, specifically Nitrogen deposition and Acid deposition	Temporary, neutral to not significant adverse
Other Ecological Sites	Degradation of habitats via hydrological pathways	Neutral
Ardley Fields Quarry LWS **County Level**	No habitat loss anticipated	Neutral
	Indirect impacts: noise, damage, or pollution events	Neutral
Upper Hayfield Airfield LWS **County Level**	No habitat loss anticipated, creation of GI buffer	Permanent, not significant beneficial
	Degradation of habitats from dust generated by construction traffic.	Temporary not significant adverse
Ardley Road Verge Nature Reserve	Loss of habitats of low ecological value, creation of GI buffer	Neutral to not significant beneficial
Ardley Fields Quarry LWS, Ardley Fields Pond East LWS Ardley Fields Pond West LWS Trow Pool LWS Stoke Wood LWS Trackway Adjacent to The Gorse pDWS, Kennel Copse pDWS **County Level**	No habitat loss anticipated	Neutral
	Degradation of habitats from dust generated by construction traffic.	Temporary, not significant adverse
Non-statutory Sites	Degradation of habitats from air pollution generated by construction traffic, specifically airborne NO_X, NH_3, Nitrogen deposition and Acid deposition	Temporary, neutral to not significant adverse
	Degradation of habitats via hydrological pathways: surface water/groundwater	Temporary, neutral to not significant adverse
The Heath pDWS **County Level**	Minor loss of Lowland Deciduous Woodland	Permanent, not significant adverse
	Degradation of habitats from dust generated by construction traffic.	Temporary, not significant adverse

Ecological Receptor / Ecological Importance	Summary of Effect	Level of Effect
Ardley and Heyford CTA **County Level**	Habitat loss/gain	Permanent, not significant adverse
	Degradation of habitats from air pollution generated by construction traffic	Temporary neutral to not significant adverse
Tusmore and Shelswell Park CTA **County Level**	No habitat loss anticipated	Neutral
Calcareous Grassland **National Level**	Habitat loss / gain	Neutral
Lowland Meadow **National Level**	Habitat loss / gain	Permanent, not significant beneficial
Neutral Grassland **Local Level**	Habitat loss / gain	Permanent, not significant beneficial
Veteran Tree **National Level**	Habitat loss / gain	Permanent **significant adverse**
Lowland Deciduous Woodland **County Level**	Habitat loss / gain	Permanent, not significant beneficial
Other Semi-Natural Broadleaved and Plantation Woodland **Local Level**	Habitat loss / gain	Permanent, not significant beneficial
Hedgerows **County Level**	Habitat loss / gain	Permanent, not significant beneficial
Ashgrove Brook and tributaries **Local Level**	Realignment of tributary ditches associated with Ashgrove Brook	Permanent, neutral to not significant beneficial
Padbury Brook tributary **Site/Local Level**	Culverted section	Permanent, neutral to not significant adverse
Gagle Brook **County Level**	Fragmentation of habitat corridor: species with limited dispersal capabilities	Permanent, **significant adverse**
	Fragmentation of habitat corridor: species with good dispersal capabilities	Permanent, neutral to not significant adverse
	Indirect impacts: edge effects, changes to hydrological and pollution pathways	Permanent, neutral to not significant adverse
All Retained Habitats – Watercourses, pond, hedgerows, scrub, mature trees, neutral grassland and woodland. **Local - County**	No habitat loss anticipated. Most retained habitats will be buffered by new green infrastructure	Neutral to not significant beneficial
Basil Thyme **County Level**	Habitat loss / gain	Neutral
	Degradation of habitats from dust generated by construction traffic	Temporary not significant adverse

Ecological Receptor / Ecological Importance	Summary of Effect	Level of Effect
	Indirect impacts: disturbance, physical damage, pollution etc.	Neutral
Meadow clary **County Level**	Habitat loss / gain	Neutral
	Degradation of habitats from dust generated by construction traffic	Temporary not significant adverse
Badger **Local Level**	Sett loss / creation	Temporary, not significant adverse
	Disturbance of retained setts	Temporary, not significant adverse
	Harm	Neutral
	Reduction in foraging opportunities until GI establishes	Temporary, not significant adverse, then neutral to not significant beneficial
Bat Roosting **Local Level**	Disturbance and or loss of small non-breeding common pipistrelle roosts within buildings [redacted] Replacement roosts provided in accordance with a Natural England licence. Loss of trees with potential to support roosting bats (no roosts confirmed by survey).	Temporary, not significant adverse
Bat Foraging **Local Level**	Direct loss and fragmentation of foraging and commuting habitats. Embedded GI will retain and buffer wildlife corridors and create enhanced habitat corridors.	Temporary, not significant adverse, then not significant beneficial
	Fragmentation of Gagle Brook corridor	Neutral (*Pipistrellus, Nyctalus* and *Eptesicus* species) Permanent, not significant adverse (other bat species)
	Lighting in accordance with Lighting Scheme	Temporary, not significant adverse (light adverse species) Neutral (*Pipistrellus*, *Nyctalus* and *Eptesicus* species)
GCN **County Level**	GCN removed from working areas to receptor sites in advance of works commencing and in accordance with a Natural England licence (embedded mitigation).	Neutral
	Fragmentation of Metapopulation 3 during construction of eastern rail connection.	Temporary, not significant adverse
	Reduction of terrestrial habitat until GI establishes	Temporary, not significant adverse,

Ecological Receptor / Ecological Importance	Summary of Effect	Level of Effect
		then **significant beneficial**
Reptiles **Local Level**	Harm	Neutral
	Reduction of terrestrial habitat until GI establishes	Temporary, not significant adverse, then not significant beneficial
Breeding birds – Farmland species assemblage **County Level** - skylark and yellowhammer **Local Level -** other species	Phased removal of nesting and foraging habitat and phased creation of new GI	Temporary **significant adverse** then not significant adverse
Breeding birds - generalist species assemblage **Local Level**	Phased removal of nesting and foraging habitat and phased creation of new GI	Temporary not significant adverse then not significant beneficial
Breeding birds	Disturbance / harm to nest sites	Temporary not significant adverse to neutral
Wintering birds - Farmland species assemblage **County Level** - golden plover, skylark, corn bunting, yellowhammer, and reed bunting **Local Level** - grey partridge, stock dove, barn owl, starling, meadow pipit	Phased removal of foraging habitat and phased creation of new GI	**Significant adverse**
Wintering birds - generalist species assemblage **Local Level**	Phased removal of foraging habitat and phased creation of new GI	Temporary not significant adverse then neutral
Wintering birds **Local** to **County Level**	Disturbance	Temporary not significant adverse
Invertebrates **Local Level**	Habitat loss including low magnitude loss of priority habitats such as calcareous grassland, neutral grassland and deadwood.	Temporary not significant adverse effect then neutral to not significant beneficial
Otter **County Level**	Habitat loss / fragmentation / creation	Permanent, not significant adverse
	Disturbance	Temporary, not significant adverse
	Harm	Neutral
Hedgehog **Local Level**	Habitat loss / fragmentation / creation	Temporary, not significant adverse, then neutral
Polecat **Local Level**	Habitat loss / fragmentation / creation	Temporary, not significant adverse (if present), then neutral

Ecological Receptor / Ecological Importance	**Summary of Effect**	**Level of Effect**
Hazel Dormouse Considered absent (but has legislative protection)	Habitat loss / fragmentation / creation	Temporary, not significant adverse (if present), then not significant beneficial
	Harm	Neutral
Signal crayfish **Non-native/Invasive species**	Potential for works to spread crayfish or their eggs beyond the species' current range	Neutral
Likely significant effect identified in bold text		

Operational Phase – Potential Effects

Sites with a Statutory Nature Conservation Designation

Oxford Meadows SAC

6.5.166. The Proposed Development has potential to affect the notification features of Oxford Meadows SAC via increased levels of air pollution, specifically the deposition of airborne oxides from road and rail traffic associated with the operational site. The air quality assessment presented in ES Chapter 4: Air Quality and Odour concluded that no exceedance of the 1% screening threshold is predicted in the concentrations of nitrogen, ammonia (NH_3), nitrogen oxides (NO_x) or in the rate of acid deposition within Oxford Meadows SAC. As such it is concluded that any changes in air quality will not lead to any detrimental effect on interest features for which the SAC is designated and the impact of air quality upon the SAC is considered to be **neutral**.

6.5.167. The Shadow Habitats Regulation Assessment that has been produced as part of this assessment has concluded that alone, or in combination with other plans or projects, the Proposed Development is not likely to have a significant effect on the qualifying features of Oxford Meadows SAC. Full details are provided within **Appendix ES6.10**.

Ardley Cutting and Quarry SSSI

6.5.168. Relevant detailed habitat creation, management and monitoring prescriptions will be included within the appropriate P-HMMP/s to ensure new grasslands establish well, and that suitable remedial action is undertaken promptly should any areas fail to adequately establish. Furthermore, in contrast to the current management of grassland habitats located within the railway cutting, the effectiveness of management of on-site grassland will not be hindered by restrictions to access.

6.5.169. By the time the Application Site is operational the majority of Ardley Cutting and Quarry SSSI will be fenced off and the management of retained SSSI habitats within the cutting returned to the jurisdiction of Network Rail. Potential adverse effects on this and other statutory sites would therefore relate only to potential indirect impacts such as those resulting from nitrogen deposition from increased traffic, or recreation impacts resulting from an increased footfall to the Ardley Wood Quarry Nature Reserve component of the SSSI.

6.5.170. Ardley Cutting and Quarry SSSI is predicted to be exposed to increased Process Contribution (PC) levels of airborne pollutants exceeding 1% of critical levels. Specifically:

- Background levels of NO_x modelled for the 2024 Base Year exceed the 30µg/m_3 critical load along a c.400m of the length Ardley Cutting and Quarry SSSI bisected by the M40 (receptors ECO1_G_10 to ECO1_G_100, and ECO1_H_10 to ECO1_H_150). In the Opening Year (2031) there is predicted to be a maximum annual mean increase above 1% NO_x PC and exceedance of the critical load extending up to c.10m west of and 20m east of the M40 (Table 4.5.29 in Appendix ES.4.5 (Chapter 4: Air Quality and Odour), with levels at and beyond these distances predicted to remain below the critical load. This effect will reduce over time, with exceedance of the critical load limited to a c.10m wide stretch by 2034 (receptor ECO1_H_10, Table 4.5.33), and no exceedance of the critical load anticipated by the end of Local Plan Year 2042 (Table 4.5.41). As such, whilst some increases are anticipated that could potentially result in minor measurable adverse change in the attributes, quality and vulnerability of the grassland constituting a low magnitude adverse effect in the short-term, these are expected to be reversible in the long-term as vehicles transition to cleaner fuels, therefore the likelihood of damage to the SSSI as a result of NO_X is considered **neutral**.
- Operation of the site is predicted to result in an increase in the maximum annual mean levels of NH_3 above the 1% screening level across the majority of the modelled transect through the SSSI (Tables 4.5.34 and 4.5.42). NH^3 levels are anticipated to exceed the critical level for higher plants (3µg/m^3) along a c.130m section that extends c.40-170m southeast of the B430 and encompasses the new Ardley bypass crossing of the SSSI (receptors ECO1_D_50 to ECO1_F_50), and also along a c.340m section of the SSSI extending southeast from the western embankment of the M40 (receptors ECO1_G_10 to ECO1_H_200). The latter section would not be subject to further increases of NH_3 of more than 0.26µg/m^3 as a result of the Proposed Development where background levels as modelled for the 2024 Base Year are in exceedance and approaching treble the critical level (up to 8.93µg/m^3). Given the magnitude of the existing exceedance and length of time for which it has likely been present it is reasonable to consider that it the SSSI habitats are already subject to the effects of air pollution within this section, such as elevated soil nutrient levels. The relatively small additional contribution to the NH_3 deposition rates

within this section of the SSSI are considered to have neutral impact on the Ardley Cutting and Quarry SSSI.

Predicted increases in NH_3 levels above the critical level in the immediate vicinity of the Ardley bypass will be more substantial (range 0.94 to 2.07µg/m^3). Given the limited spatial extent of significant reductions in air quality in relation to higher plants it is considered that the impact could result in a long-term **not significant adverse** effect on the condition of the SSSI features within this c.130m section.

- A maximum annual mean increase above 1% Nitrogen deposition screening threshold is predicted across the majority of the SSSI receptors in the short-term (Table 4.5.31), and across all receptors in the longer term from 2042 (Table 4.5.43). Nitrogen deposition baseline concentrations within the SSSI are predicted to exceed the 10kg N/ha/yr critical load along a c.360m stretch from the western edge of the B430 to the southeast of the new Ardley Bypass to (receptors ECO1_C_10 to ECO1_F_200). Predicted increases in Nitrogen deposition rates are most pronounced (>5kg N/ha/yr) along a c.80m length in the immediate vicinity of the proposed Ardley Bypass (receptors ECO1_E_10 to ECO1_F_50) and <5kg N/ha/yr at all other points. Background levels of Nitrogen deposition modelled for the 2024 Base Year exceed the critical load from 10m west of the M40 to c.260m southeast of the M40 crossing (receptors ECO1_G_10 to ECO1_H_200). The changes in air quality resulting from the Proposed Development could impact the vulnerability of the SSSI to some detrimental changes such as nutrient enrichment promoting more vigorous grass species, resulting in minor detrimental alteration to grassland condition and species composition and impacting on the effectiveness of future management, which constitutes a long-term, low magnitude **not significant adverse** effect on the condition of the SSSI features within the sections identified above.
- Background Acid deposition rates modelled for the 2024 Base Year exceed the critical load of 1keq/ha/yr at all receptor points within the Ardley Cutting and Quarry SSSI. The operation of the site is predicted to result in an exceedance of the 1% screening threshold along the full length of the modelled transect, therefore all locations will continue to be in excess of this critical load, albeit many will be subject only to very small increases in Acid deposition, with all receptors northwest of the B430 and all those southeast of the M40 experiencing increases of <0.1keq/ha/yr. The underlying limestone soils are expected to have a buffering effect on the effect of Acid deposition, therefore whilst some

increases are anticipated, the potential impacts of Acid deposition on the SSSI are considered low magnitude **not significant adverse**. It is relevant to note that this assessment has been based on a precautionary critical load of 1keq/ha/yr, whereas the acceptable critical level range for the SSSI provided by APIS ranges from 0.856 to 4.856 keq/ha/yr. Acid deposition rates will not exceed this range at any of the receptor locations within the SSSI.

6.5.171. The AQA was undertaken using a precautionary approach that assumed conservative estimates and/or worst-case scenarios for the data sources listed below:

- In the absence of available vehicle emission factor data for the final two years of the period subject to the AQA the year 2040 data were utilised to predict pollutant concentrations in the 2042-based scenarios. This represents a conservative approach, as this does not account for the additional two years in potential vehicle emission reductions expected between 2040 and 2042.
- No improvements in NH_3 emission rates from vehicles have been assumed beyond 2030 due to the degree in uncertainty in projections made by available analysis tools beyond this date. Future NH_3 concentration contributions from the Proposed Development are therefore likely to have been overestimated as a result of an underestimation of the increasing proportion of road journeys made by electric vehicles rather than petrol and diesel vehicles.
- Future background concentration predictions for NH_3, Nitrogen deposition and Acid deposition are not available on APIS. For conservatism, it has been assumed that none of these will improve in the future, beyond the APIS baseline year of 2021.

6.5.172. In light of the above, and within the context of the majority of the SSSI not comprising qualifying calcareous grassland habitat, the influence of the operational Site on air quality parameters is not considered likely to result in any significant deterioration of the condition or extent of qualifying habitats within the SSSI. Furthermore, whilst long-term elevated levels of NH3, nitrogen and acid deposition are predicted across sections of the SSSI closest to the affected road network these are not considered of sufficient magnitude to significantly prevent the recovery of impacted habitats, or to undermine the biodiversity objectives of the SSSI. The unmitigated influence of the operational Site on air quality parameters and associated effects on

this National level receptor would be **permanent and neutral to not significantly adverse**.

6.5.173. The hydrology of the Application Site is fully discussed within ES Chapter 9: Water Environment, including the embedded sustainable drainage strategy that will maintain water run-off at existing greenfield rate and quality and ensure that the condition of the SSSI and supporting habitats are not adversely affected by any change in hydrology resulting from the proposals (**neutral** effect). This has been designed to ensure that sufficient controls are in place to regulate flows into the SSSI and the watercourses within the Application Site, as well as other wetland habitats of value. The attenuation facilities and overall SuDS with vegetated swales will filter pollutants from surface water prior to discharge to watercourses and reduce any potential impacts from road run off.

6.5.174. The operation of the rail freight terminal has potential to result in effects from light pollution onto the adjacent Ardley Cutting and Quarry SSSI habitats. The embedded lighting strategy (Chapter 8) has however sought to ensure that light spill onto retained SSSI habitats will be minimised through the use of back light shields or other mitigation as appropriate to limit this to very low levels (c.0.2 Lux) and to isolated locations. Artificial lighting during the operation of the SRFI will therefore result in a **not significant adverse effect** on light-sensitive bat species, and a **neutral** effect on relatively light tolerant species.

6.5.175. The section of the SSSI comprising Ardley Wood Quarry Nature Reserve has an established network of footpaths and is managed by the Wildlife Trust for recreational use. Recreational access to the remainder of the SSSI is not feasible due to the presence of security fencing alongside the rail embankment tops.

6.5.176. Bridleways crossing the SSSI will be routed via existing bridges. With the exception of the bridge crossings, the SSSI habitats alongside the rail track will continue to be inaccessible to the public. An existing informal footpath linking to the northern edge of Ardley Wood will be upgraded. This will serve to encourage visitors to remain on the formal pathways and hence minimise localised damage to habitats such as via trampling.

6.5.177. Given the employment nature of the Proposed Development any increase in recreation pressure on the SSSI resulting from the SRFI itself would be negligible/low magnitude. The realignment of a public right of way to the west of the Ardley Wood Quarry Nature Reserve component of the SSSI will

however feasibly result in an increase in visitor pressure from local residential areas including the adjacent residential development within Heyford Park, with corresponding potential for habitat degradation as an indirect effect of an increase in foot traffic.

6.5.178. There is an existing informal path along the proposed realigned right of way that leads from a formal entrance to the Reserve and that is used as a regular walking route by local residents. As a result, the vegetation along the path, comprising species-poor grassland, ruderal species and bramble scrub is locally compacted. The provision of a maintained and well-defined formal footpath along this section will encourage visitors to adhere to the formal path network. Furthermore, the wider scale creation of additional footpaths, cycleways and bridleways through and around the Proposed Development will provide alternative opportunities for recreation use within the local area. Any increase in use of the Ardley Woods reserve from the adjacent urban area and from SRFI personal will therefore likely be of low magnitude and will not result in a significant increase in recreational effects above those the reserve is already designated to accommodate, in accord with the Wildlife Trusts' "Providing Access to Nature" remit and associated initiatives to connect people with natural spaces.

6.5.179. The effect of any increase of recreational pressure upon the Ardley Wood component of the Ardley Cutting and Quarry SSSI will be managed through careful detailed design and by implementing the following management principles within the Application Site as appropriate:

- Limiting access from the Application Site through the use of fencing or strategic planting of native species;
- Provision of waymarked and surfaced footpaths to provide clear routes of access avoiding sensitive areas;
- Use of interpretation to explain the importance of retained habitats, and
- Provision litter bins.

6.5.180. With the implementation of the above any operational effects on Ardley Wood Quarry Nature Reserve as a result of increased recreational use would be **permanent**, and **not significant adverse**.

<u>Other Statutory Designated Sites of Nature Conservation Value and Non-Statutory Sites</u>

6.5.181. The potential operational impacts to non-statutory sites as a result of the Proposed Development include indirect effects occurring as a result of changes to air quality, local hydrology, and potential additional recreational pressure as local residents or employees make use of improved and new foot and cycle links and connectivity.

6.5.182. Trampling of vegetation and the compaction of soil as a result of increased visitor pressure can lead to the degradation of habitats. Notable effects include alterations in the diversity of plant communities and vegetation structure and also reduced survival rates of the species that depend upon these habitats. Ardley Road Verge Nature Reserve falls partially within the boundary of the Main Site, and it is reasonable to expect that in the absence of mitigation would be subject to an increase in recreational activity due to access by SRFI personnel utilising the created pedestrian link. Such activity will however likely be highly localised to the sealed path and grassy ride providing a 'cut-through' onto site, with the sensitive grassland habitats of the reserve protected by fencing and with suitable signage indicating their ecological value and sensitivity. In the absence of additional mitigation this may result in a reduction in the extent of existing ground flora, including meadow clary.

6.5.183. The HMMP specifies details for the implementation of mitigation measures, including strategic planting, fencing waymarked footpaths, and provision of interpretation boards appropriate to protect sensitive habitats associated with adjacent ecological sites including the Ardley Fields Quarry LWS and also population of rare plants at Ardley Road Verge Nature Reserve from the adverse effects of increased recreational pressure. Therefore, the impact of recreational pressure upon non-statutory sites is considered to be **neutral**.

Air Quality

6.5.184. Of the remaining statutory sites included within the Air Quality Assessment, and the non-statutory sites also included, those predicted to be exposed to increased PC levels of airborne pollutants exceeding 1% of relevant screening thresholds and exceeding critical level/loads are considered below. Details of the predicted annual mean concentrations for each receptor location are listed in Appendix 4.5 of Chapter 4:Air Quality and Odour.

Nitrogen deposition

6.5.185. The proposed Middleton Stoney Relief Road will lie close to and broadly parallel to Burntclose Copse AW, resulting in this site being subject to an increase in Nitrogen deposition above the 1% screening threshold and N/ha/yr critical load from the development completion date (2031) to the end of the projected period (2042) and likely beyond, with increases of 1.39 to 2.60 N/ha/yr predicted over the period assessed.

6.5.186. As a woodland habitat Burntwood Copse AW will to some extent ameliorate the impacts of airborne nitrogen by dampening the extent to which it spreads out from the road, resulting in any impacts being greatest at woodland edge habitats closest to the new road. Furthermore, the AQA does not consider the proposed woodland planting that will create a c.25-55m wide habitat belt along the eastern edge of Burntwood Copse as part of the proposed green infrastructure (see Figure 5.6 in Appendix ES6.9: Biodiversity Net Gain Assessment). Once established this new planting will act as a physical barrier and absorb pollutants, therefore in the long-term the ultimate spread and levels of pollutants can reasonably be expected to be lower than those reported above. Therefore, while there is a risk to the condition of Burntwood Copse, as a consequence of the limited spatial scale of detrimental alteration, further reduced by the buffer planting in the long-term, the impact is considered **not significant adverse**.

6.5.187. Some short-term exceedances of the 1% screening threshold and Nitrogen deposition critical load are predicted across Ardley Fields Quarry LWS, Ham Home-cum-Hamgreen Woods SSSI, Long Herdon Meadow SSSI, Shabbington Woods Complex SSSI, Wendlebury Meads and Mansmoor Closes SSSI, Digging Copse AW, Graven Hill Wetlands Proposed DWS, Meizen Copse AW; Trow Pool LWS, Twelveacre Copse AW, Unnamed - Adj to Rowles Farm Solar Park AW, Unnamed Trixax Park Oxford AW. Rates of Nitrogen deposition will however decline across all these sites such that by 2042 Nitrogen deposition rates at all receptor locations will be below the above thresholds. Any resulting short-term impacts to constituent habitats such as an increase in the growth of more vigorous species will resolve over time such that the long-term operational effects of the Development on these sites are likely to be imperceptible and hence are assessed as **neutral**.

NO_X

6.5.188. Elevated NO_X levels can result in eutrophication (nutrient enrichment) that encourages vigorous growth of a wide range of vascular plant species, and which can be detrimental to the persistence of low-growing flora, those

adapted to nutrient-poor environments and notably to habitats supporting lichens or bryophytes.

6.5.189. Some short-term exceedances of the NO_X screening threshold are predicted in sections of Ardley Fields Quarry LWS (up to approximately 15m west of the M40), Meizen Copse AW (two c.20m sections) and the entirety of the Unnamed Trixax Park Oxford AW where the 1% screening threshold is also predicted to be exceeded (Tables 4.5.29 and 4.5.33). With the exception of a section of the Unnamed Trixax Park Oxford AW extending up to 40m from the M40 the NOX levels all drop in the longer term (2042 and beyond) as vehicles transition to cleaner fuels (Table 4.5.41). With the exception of the Unnamed Trixax Park Oxford AW it is considered unlikely that the predicted increase in NO_X deposition would result in a detectable alteration to the composition or condition of the other sites listed within Tables 6.11 and 6.12, and therefore the potential impacts are considered of **neutral** significance.

6.5.190. The Unnamed Trixax Park Oxford AW site is located immediately adjacent the M40 and as a result the background NOX deposition rates are in exceedance of the 30µg/m^3 critical load for NOx at all receptor locations through the site (39.8 to 63.1 µg/m^3, see Table 4.5.27). By the end of the modelled time period (2042) habitats within 30m of the motorway (ECO15_A_20 to ECO15_A_40) will be subject to additional increases in NOx deposition rates (of 0.8 to 1.0 µg/m^3) that exceed the 1% screening threshold. Given the magnitude of the existing levels of exceedance and the duration over which these have likely been present, it is reasonable to assume that the woodland habitats closest to the road are already adversely impacted by the effects of air pollution and are unlikely to support lichens or other NO_X sensitive communities. Increased NO_x deposition rates within the Unnamed Trixax Park Oxford AW due to the operational development will therefore result in a permanent, **not significant adverse** impact on woodland habitat condition and composition within the influence zone of the motorway.

Ammonia/NH_3

6.5.191. The background NH_3 deposition rates indicate that background levels are already in exceedance of the relevant critical Levels (1.0 or 3.0 µg/m^3) at every receptor location within Ham Home-cum-Hamgreen Woods SSSI, Burntclose Copse AW, Digging Copse AW, Meizen Copse AW, Stoke Little Wood AW, Twelveacre Copse AW, Unnamed - Adj to Magnolia Park AW, Unnamed - Adj to Rowles Farm Solar Park AW, and Unnamed Trixax Park Oxford AW (Table 4.5.26). Existing exceedances are also present across

parts of Ardley Fields Quarry LWS, Trow Pool LWS, Shabbington Woods Complex SSSI, and Wendlebury Meads and Mansmoor Closes SSSI.

6.5.192. Long-term exceedances of the screening threshold and relevant critical level are predicted as a result of the Proposed Development across all receptor locations within Ardley Fields Quarry LWS, the Unnamed - Adj to Magnolia Park AW and Unnamed Trixax Park Oxford AW, and across parts of Ham Home-cum-Hamgreen Woods SSSI, Shabbington Woods Complex SSSI, Wendlebury Meads and Mansmoor Closes SSSI, Trow Pool LWS and Digging Copse AW (Table 4.5.42). Furthermore, a short-term exceedance in NH3 levels is anticipated at Meizen Copse AW but with levels predicted to drop below the screening level by 2042. Of the sites with predicted long-term increases in NH3 deposition rates above the critical level, increases will be of relatively low magnitude (<0.1µg/m^3) across Ham Home-cum-Hamgreen Woods SSSI, Wendlebury Meads and Mansmoor Closes SSSI, Digging Copse AW, and Unnamed Adj to Magnolia Park AW, but more substantial across Ardley Fields Quarry LWS (range 0.14-0.21µg/m^3), Shabbington Woods Complex SSSI (0.05-0.17 µg/m^3), Trow Pool LWS (0.10-0.18µg/m^3), and the Unnamed Trixax Park Oxford AW (0.09-0.18 µg/m^3).

6.5.193. As noted above, habitats already subject to widespread exceedance of the relevant critical Levels for NH3 deposition, particularly where levels have likely been elevated for a considerable period are unlikely to support sensitive plant species assemblages associated with low nutrient environments. The predicted increases are considered unlikely to result in a discernible effect on site condition and at most represent a **not significant adverse** impact that would not prevent habitat recovery if wider-scale reductions in background levels are subsequently achieved, such as via increasing use of electrified vehicles above the conservative levels assumed within the AQA.

Acid

6.5.194. Background Acid deposition rates modelled for the 2024 Base Year exceed the critical load of 1keq/ha/yr at all receptor points within each of the ecological sites included within the AQA (Table 4.5.28), though it is relevant to note that the standardised critical load of 1.0 keq/ha/yr referenced within the AQA is towards the lower end of the Max/Min range of critical loads provided by APIS for each of the statutory designated sites (Tables 6.11 and 6.12). Baseline levels at two of the 13 receptor locations at Meizen Copse AW and 4 of the 6 receptor locations at Unnamed Trixax Park Oxford AW however are higher than corresponding maximum critical loads listed in Tables 6.11 and 6.12.

6.5.195. Once operational the Proposed Development is predicted to result in exceedances of the 1% screening threshold within the majority of the ecological sites subject to assessment, though at Long Herdon Meadow SSSI, Graven Hill Wetlands Proposed DWS and Meizen Copse AW these increases are predicted to be of low magnitude (<0.02 keq/ha/yr) and short-term, with projected levels of Acid deposition for these sites all dropping below the screening level by 2042 (Tables 4.5.32, 4.5.36 and 4.5.44).

6.5.196. Of the ecological sites that will continue to be subject to Acid deposition levels in exceedance of the 1% screening threshold and 1.0 keq/ha/yr critical load, Burntclose Copse AW will experience increases of 0.12 to 0.18 keq/ha/yr, whereas Ardley Fields Quarry LWS, Trow Pool LWS, Shabbington Woods Complex SSSI and Unnamed Trixax Park Oxford AW will all be subject to long-term increases of <0.09 keq/ha/yr, Ham Home-cum-Hamgreen Woods SSSI, Wendlebury Meads and Mansmoor Closes SSSI, Digging Copse AW and Unnamed - Adj to Magnolia Park AW to increases of <0.03 keq/ha/yr, and Twelveacre Copse AW and Stoke Little Wood AW subject to increases of no more than 0.01 keq/ha/yr and at only two and one receptor locations respectively.

6.5.197. Of the above sites Ardley Fields Quarry LWS, Trow Pool LWS, Burntclose Copse AW, Digging Copse AW, Twelveacre Copse AW and Stoke Little Wood AW are all located in areas of lime-rich soils[76] that can reasonably be expected to have a buffering effect on the effect of Acid deposition.

6.5.198. Increases in Acid deposition rates in the long-term of up to 0.09 keq/ha/yr at the Shabbington Woods Complex SSSI and 0.07 keq/ha/yr at the Unnamed Trixax Park Oxford AW are proportionately very small within the context of existing background levels, and in the case of Shabbington Woods Complex SSSI will largely remain at less than half the upper critical load provided by APIS for this site (11 of 13 receptor locates <2.53 keq/ha/yr).

6.5.199. All exceedances at the remaining sites can be described as low magnitude and in all cases the predicted impacts of Acid deposition from the operation of the completed site can be regarded at their most precautionary as a **not significant adverse** significance, with several subject to neutral impacts unlikely to result in any discernible effect on the composition or condition of constituent habitats.

[76] https://www.landis.org.uk/soilscapes/

AQA Results Summary

6.5.200. The AQA detailed within Chapter 4: Air Quality and Odour predicted a number of generally low magnitude exceedances of air quality screening thresholds at statutory and locally designated sites as a consequence of the construction and operation of the Proposed Development. The majority of pollutant increases will be concentrated closely adjacent to the affected road network, however some instances screening threshold exceedances are anticipated to extend up to 200m from carriageways.

6.5.201. The significance of effects has been assessed within the context of predicted changes to existing baseline emissions and include consideration of potential in-combination effects. Where there is uncertainty with regard to the robustness of data projections inputted into the AQA, a precautionary approach has been taken.

6.5.202. It is anticipated that sections of Ardley Cutting and Quarry SSSI will be subject to elevated levels of key airborne pollutants such that localised low magnitude impacts are anticipated to the composition and condition of the calcareous grasslands that comprise qualifying interests of the site designation. Elevated levels of NH_3, nitrogen and acid deposition across sections of the SSSI closest to the affected road network would persist into the long-term, however are not considered of sufficient magnitude to significantly prevent the recovery of impacted habitats if wider-scale reductions are achieved in background levels over time. As such the overall impacts to the SSSI arising from airborne pollutants are considered to be negligible to **not significant adverse**.

6.5.203. A not significant adverse impact to Burntwood Copse AW is identified due to elevated levels of Nitrogen deposition as a result of the operation of the Proposed Development. Potential operational impacts from Nitrogen deposition are considered to be of negligible at all other ecological sites assessed within the AQA.

6.5.204. A **not significant adverse** impact due to increased NOx deposition rates at the Unnamed Trixax Park Oxford AW is identified within the influence zone of the M40. A negligible impact from NOx deposition is anticipated at all other ecological sites assessed within the AQA.

6.5.205. Meizen Copse AW is anticipated to be subject to a short-term not significant adverse impact due to elevated NH3 levels and Ardley Fields Quarry LWS, Unnamed Trixax Park Oxford AW, and parts of Ham Home-cum-Hamgreen

Woods SSSI, Shabbington Woods Complex SSSI, Trow Pool LWS to long-term not significant adverse impacts. NH3 will have a negligible long-term effect on all other ecological sites assessed within the AQA

6.5.206. A not significant adverse impact due to increased rates of Acid deposition resulting from the operational development will act on Ardley Fields Quarry LWS, Shabbington Woods Complex SSSI, Burntclose Copse AW, Trow Pool LWS, and the Unnamed Trixax Park Oxford AW. Impacts from Acid deposition are considered to be of negligible at all other ecological sites assessed within the AQA.

6.5.207. As is the case for Ardley Cutting and Quarry SSSI, the magnitude and extent of predicted increases in air pollutants resulting from the operation of the OxSRFI are not considered such that these would prevent the recovery of impacted habitats if, for example, government objectives and/or future technological betterments succeed in achieving wide-scale reductions in air pollutant levels.

6.5.208. The AQA takes account of projected increases in vehicle movements from relevant committed development and allocated sites and therefore considers likely cumulative effects arising from such developments in combination with the proposed SRFI development. As such cumulative air quality impacts have been accounted for and no further in-combination assessment is required.

Rail Emissions

6.5.209. It is understood that when at full capacity the operational SRFI will result in an additional 12 two-way freight train movements per day to the new rail freight terminal, which has the potential to influence local air quality.

6.5.210. As detailed within Section 5 of Chapter 4 Air Quality and Odour, this level of additional rail activity on the Chiltern Main Line does not exceed the screening criteria for stationary and moving diesel locomotives provided within current DEFRA guidance[77] and summarised within Table 4.27 of Chapter 4. As such a detailed assessment of rail emissions was scoped out of the assessment of air quality impacts, as agreed with CDC.

6.5.211. Given the proximity of the Ardley Cutting and Quarry SSSI to the Chiltern Mainline Natural England requested during Stage 2 consultations that rail

[77] DEFRA 2022. *Local Air Quality Management Technical Guidance* (LAQM.TG(22)).

emissions resulting from the operational development be afforded appropriate consideration. Further rationale for screening out rail emissions from the air quality impact assessment is provided within Chapter 4 and for ease of reference is reproduced below.

- Prior to the COVID-19 Pandemic, the Chiltern Mainline hosted up to 127 diesel-hauled train movements per day. This has since reduced to approximately 89 per day and, with the introduction of the Proposed Development, it will remain below the total volumes of 2019. Consequently, it is unlikely that total rail emissions from diesel-hauled train movements will be significantly greater than they have been in recent history.
- Baseline air quality in rural areas across Cherwell is consistently below Defra's recommended annual mean NO2 screening criteria of 25µg/m3 and is predicted to continually improve in the future. Additionally, GB Railfreight Limited is in the process of improving their freight fleet emissions and are introducing Class 99 locomotives in the coming years[78], which run on hydrotreated vegetable oil (HVO) and meet Euro V emission standards. Consequently, it is likely that air quality conditions through rural areas along the Chiltern Mainline will improve in the future.
- Paragraph 2.29 of the National Planning Policy Statement for National Networks[79] states than a single freight train can remove up to 76 HGVs from the road. Consequently, the SRFI scheme should principally lead to improved air quality along the arterial road network.
- Regarding idling emissions at the new rail terminal, the Ardley Cutting and Quarry SSSI is located further than 15m from the nearest rail line.
- The detailed SSSI survey confirmed the closest 5 to 17m of the SSSI to the SRFI supports habitats that are not considered sensitive to air quality (primarily scrub and arable field margin, see Figure 3 in Appendix ES6.2: Ardley Cutting & Quarry SSSI Botanical Survey Report).
- Additionally, the rail corridor and terminal area is to be excavated to a depth of more than 15m below the surface, and a 3m tall noise fence is to be installed between the terminal and SSSI, as shown in BWB's earthworks cross-section drawing (Ref: OxSRFI-BWB-HGT-ZZ-DR-

[78] GB Railfreight 2025. Class 99. https://www.gbrailfreight.com/class99/
[79] Department for Transport 2024. National Planning Policy Statement for National Networks, HMSO London.

CH-0621). This results in an effective separation distance between the rail terminal and SSSI of at least double what it would have been without these physical obstructions.

- Lastly, it is reasonable to assume that a substantial proportion of exhaust gas emitted from idling locomotives will recirculate within, and disperse across, the rail terminal, rather than spill over the top of the deep cutting and noise fence, due to the low exhaust gas temperatures and velocities associated with idling engines.

6.5.212. In accordance with the screening assessment undertaken in Chapter 4 it is concluded that the impacts on local air quality from rail emissions as a result of the Proposed Development are negligible and not significant.

Habitats

6.5.213. Following construction and once operational, the retained vegetation, including woodland, hedgerows and trees, may be adversely impacted by an increase of human presence and any associated recreational activities, though given the non-residential nature of the development, the magnitude of any such increase would be relatively small. Without mitigation it is expected that these effects would primarily be associated with formal footpaths or informal desire lines, and therefore highly localised. The small postconstruction increase in visitor pressure upon the woodland, hedgerows and trees is likely to be localised and low magnitude, resulting in a **permanent, not significant effect** at a **local** scale.

6.5.214. The close proximity of the development footprint to the retained woodland blocks along Ashgrove Brook could result in effects from light pollution on the woodland edge. The embedded lighting strategy (Chapter 8) will however ensure there is minimal light spill onto retained and newly created structural habitats, including no light spill from street lighting onto Ashgrove Brook except where lighting is required on junction approaches.

6.5.215. Implementation of long-term, sympathetic management of retained and newly created green infrastructure within the Application Site as detailed within the HMMP will deliver a **not significant beneficial** effect at a local to **county** scale.

6.5.216. The Proposed Development will deliver biodiversity net gains in line with NPPF and local planning policy and ensure that the function and diversity of the site are not only maintained, but where possible, enhanced. Further details of the BNG assessment are provided at **Appendix ES6.9**.

Habitat Fragmentation

6.5.217. Potential operational phase impacts on the condition and integrity of retained woodland habitats within the Gagle Brook corridor include increased edge effects, an elevated mortality risk for species such as badger and otter that are vulnerable to mortality via vehicle collision, and deterioration of surface water and/or groundwater quality. Furthermore, the disruption of the movement of species initiated during construction will continue throughout the operational phase and can over time result in the loss of genetic diversity, particularly for species with restricted dispersal capacity including some woodland flora such as bluebell *Hyacinthoides non-scripta* and Herb Paris *Paris quadrifolia* that each have relatively heavy seeds (though both species being relatively widespread).

6.5.218. In the absence of additional mitigation, the operational relief road will result in permanent local scale adverse impacts on retained woodland habitat and on associated faunal species where these have limited dispersal capabilities and hence are susceptible to isolation effects, and/or individuals are deterred by edge effects including elevated noise and light pollution. The influence of isolating effects will vary between ecological receptors, with **significant adverse** impacts likely experienced by more highly specialist woodland species/assemblages and/or receptors with low dispersal ability in the long-term as restrictions to gene-flow come into effect. The fragmentation effect of the operational road will have a **neutral to not significant adverse** impact on more mobile and generalist species and on woodland habitats.

6.5.219. The operational road has potential to indirectly effect brook corridor habitats and associated species assemblages via surface water runoff from road surfaces altering existing hydrological regimes, or by sediment and/or fuel residues within road runoff reaching and degrading the brook channel aquatic habitats or groundwater resources, potentially also impacting woodland habitats via tree roots. As confirmed within ES Chapter 9 (Water Environment) the embedded sustainable surface water drainage strategy will provide the majority of the water quality mitigation for the Proposed Development. An operations and maintenance schedule will additionally be implemented for the proposed SuDS, to include routine inspection, maintenance, and remedial actions appropriate to ensure the effectiveness of the proposed stages of water quality treatment throughout the lifetime of the Proposed Development. As such operational influences on surface water will resulting in a **non-significant adverse** effect on the water quality within Gagle Brook and on associated woodland habitat.

Fauna

6.5.220. The following section considers the likely operational impacts of the Proposed Development upon faunal species.

6.5.221. For all faunal species/groups listed, the sympathetic management of retained and newly created green infrastructure throughout the Site as detailed within the HMMP will deliver long-term local level benefit. Unless otherwise stated these will comprise **not significant beneficial effects**.

Badger

6.5.222. The layout of the Proposed Development will introduce potential barriers to movement of badgers, such as roads and industrial areas, which may limit their access to available habitat both within the Main Site and the surrounding areas, and also within the Highway Works areas. The partial retention of structural habitats and provision of badger tunnels under access roads will however maintain suitable corridors of movement for badgers, and the embedded GI such as around the perimeter of the Main Site will provide new habitat linkages and opportunities for set creation, suitable to offset habitat fragmentation elsewhere within the Site.

6.5.223. The new roads serving the Main Site, improvements to Junction 10 of the M40, the Ardley Bypass, Middleton Stoney Relief Road and Heyford Park Link Road will likely lead to increased levels of badger mortality due to road traffic collision. An increase in badger mortality rates may affect the integrity of the badger population through lowered survival rates, limitations to dispersal or a reduced breeding success, though in high-quality habitats badger populations are often able to maintain their status despite relatively high levels of mortality. The magnitude of any potential impact is likely to be limited by the existing badger populations habituation to the M40, G430, Ardley Road and Camp Road and as such is considered to be low. Any impact from increased mortality due to road traffic will therefore result in a local level **permanent not significant adverse** effect.

Bats

6.5.224. New roads and junctions may lead to an increase in mortality of bats where these will breach new or retained foraging and commuting routes including hedgerows, treelines and watercourse corridors. Ashgrove Brook for example will be breached by new roads at least four locations. Vehicle

speeds within the Main Site will however be limited to below 40 mph, and moreover the most significant of the brook crossing points within the Main Site comprises a roundabout where vehicles will be moving even more slowly. The GI corridors will provide alternative flight lines around the Main Site that will further reduce the risk of direct harm to bats.

6.5.225. The Ardley Bypass Road will have minimum headroom of 5.1m above the Chiltern Main Line and associated vegetated embankments and will retain suitable open flight corridors for bats along each embankment. As such it anticipated the majority of bats, and particularly the slower flying and more light sensitive species will avoid the risk of vehicle collision by flying under the bridge rather than over it.

6.5.226. Gagle Brook and associated habitat corridor will be breached at a single location by the Middleton Stoney Relief Road. This habitat feature is regularly used by foraging and commuting individuals of all species recorded present. Several of these, including the Annex II species barbastelle, frequently fly at a height that places them in the risk zone for vehicle collisions. In the absence of additional mitigation, once operational there is therefore an increased risk of mortality for bats utilising the Gagle Brook corridor at this location, and at other locations where new roads will cut through existing habitat corridors.

6.5.227. No evidence of a maternity roost was recorded via the field surveys undertaken across the Application Site, therefore impacts would most likely operate on individual foraging/commuting bats and as such are unlikely to adversely affect the viability of species at a population level. Given the embedded design of the bridge over the rail track and of GI provision suitable to maintain the favourable conservation status of local populations for all bat species recorded, in the absence of additional mitigation the operational effect is considered to be **permanent, significant adverse** at the location of the Gagle Brook crossing, and **permanent, neutral to not significant adverse** throughout the wider site.

Bat - Lighting

6.5.228. 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. Whilst it is noted that the faster flying species such as noctule are largely

unaffected.by artificial lighting and some bats species such as common pipistrelle can adapt to increased lighting regimes, artificial lighting has the potential to result in adverse effects to how efficiently bats can utilise habitats adjacent to the built development, access roads and lit pathways.

6.5.229. Artificial lighting along Ardley Cutting and Quarry SSSI will be limited to a section of the new rail terminal opposite Ardley Wood that will be subject to light levels of >0.2 Lux. The 0.2 Lux isoline will not extend fully across the existing train tracks or reach the habitats on the opposite embankment (see the Indicative Spill Diagrams at Appendix ES.8.5).

6.5.230. No street lighting is proposed along the Middleton Stoney Relief Road in the vicinity of the Gagle Brook crossing (ES Figure 8.1, Sheet 02) or other new highways except in the vicinity of road junctions (see the embedded lighting strategy (Chapter 8: Lighting)). Furthermore, the GI provided as part of the embedded mitigation will buffer many of the retained linear habitats and create additional new dark habitat corridors suitable to facilitate movement of all local bat species through the landscape, and the use of back light shields, as detailed within Chapter 8 will maintain the majority of the above receptors unlit.

6.5.231. Low magnitude changes in isolated locations at the Ardley Cutting and Quarry SSSI and at Burntclose Copse and across the operational site will result in reversible, local level **neutral** (*Pipistrellus*, *Nyctalus* and *Eptesicus* species) to **not significant adverse** impacts (more light adverse species) on foraging, commuting and roosting bats.

Great Crested Newts

6.5.232. The increased risk of GCN mortality during operation of the development due to increased road activity or to newts become trapped in roadside gullies will be mitigated through the provision of appropriate fencing, off-set gulley pots and dropped kerbs[80], as detailed within the GCN licence documents agreed in principle with Natural England and that will form embedded mitigation. Accidental mortality or injury of GCN during operation of the development is Therefore, considered to be reduced to a **neutral** effect.

6.5.233. New access roads may nevertheless form partial barriers to the movement of GCN, however given the current absence of the species from the vast majority of the Application Site the restriction would be on the potential future

[80] English Nature, 2001. *Great Crested Newt Mitigation Guidelines*, English Nature, Peterborough.

expansion of the largely offsite metapopulations and would not represent an adverse effect on the current conservation status of the species (**neutral to not significant adverse** effect).

6.5.234. The embedded long-term management of green infrastructure across the Proposed Development will deliver extensive areas of suitable habitat for GCN, including a habitat corridor to the south of the Main Site incorporating a series of vegetated SuDS with areas of permanent water within a matrix of species-rich grassland, tree and scrub planting that will provide high quality habitats linking the currently separated metapopulations to the east and west of the Site. As the GCN mitigation areas have been designed to provide aquatic and terrestrial habitats of sufficient size and quality to maintain the Favourable Conservation Status of translocated populations and enable population expansion, the embedded GI will provide a **long-term**, **significant beneficial** effect for GCN at a **local** level.

Reptiles

6.5.235. There is potential for grass snake and common lizard to access the operational Application Site and be accidentally harmed by traffic. However, these are highly mobile, and readily visible species that can move relatively quickly, therefore in the event either might enter the operational area, the risk of coming to accidental harm is considered very low. Consequently, the risk of direct harm to reptiles is considered to be a local level **permanent, neutral to not significant adverse** effect.

Birds

6.5.236. The Proposed Development will, when operational, lead to an increase in disturbance to birds due to the proximity of development to retained habitats, as well as the increase in noise and light disturbance resulting from the operation of the Rail Freight Interchange and associated road network. In the absence of additional mitigation this is likely to result in the avoidance of parts of the Site by bird species that are relatively sensitive to disturbance and lead to the loss of kestrel and barn owl from the Site, resulting in a **permanent not significant adverse** effect on these species locally.

6.5.237. Where footpaths are proposed to be routed alongside areas of created open grassland there is additional disturbance risk arising from increased noise and activity leading to nest abandonment. Increased recreational activity could also lead to the trampling of ground nests by both people and dogs where footpaths are not kept to and to the general degradation of suitable

habitat through trampling, litter, and eutrophication such as via dog waste. Birds are considered to be more wary of dogs than people alone and are known to flush from their nests more frequently and at greater distances when disturbed by dogs[81]. In the absence of additional mitigation disturbance to the farmland bird assemblage could represent a **significant adverse effect** at a local level.

6.5.238. Proximity to roads is known to effect breeding bird density. Whilst it is not certain how various factors contribute to this effect, noise is one contributory factor. The influence of noise disturbance on birds is poorly understood, but Raijneen *et al*[82] have provided a threshold-based model by studying the effects on bird populations in The Netherlands. Based on the anticipated traffic load and vehicle speeds along the proposed Ardley Bypass and the Middleton Stoney Relief Road and the open nature of the surrounding habitats it is anticipated that bird populations may experience a reduced density at a distance of up to 125m from the roads. This disturbance effect is however unlikely to alter the assemblage of breeding birds. It is considered that the overall abundance of the general breeding bird species assemblage will be reduced, resulting in a **permanent not significant adverse** effect at a **local** level.

6.5.239. Similarly, the proposed road improvements and new road infrastructure will result in a permanent disturbance to wintering birds. The farmland bird species recorded, such as skylark, yellowhammer, linnet and corn bunting will likely relocate to suitable winter foraging habitat available within the local area. In the absence of additional provision for wintering birds within the Application Site it is considered that operational effects on wintering birds within the Application Site will result in **permanent, not significant adverse to significant adverse** effects at a **local to county** level.

6.5.240. In areas not directly impacted by the road network the status of the generalist bird assemblage that make use of the hedgerow and tree habitats scheduled for retention is anticipated to remain largely unchanged from that during construction, considered a **neutral** effect.

Invertebrates

[81] Murison, G. 2002. The impact of human disturbance on the breeding success of nightjar *Caprimulgus europaeus* on heathlands in south Dorset, England. English Nature, Peterborough.
[82] Reijnen, R., Foppen, R., and Veenbaas, G. 1997. Disturbance by traffic of breeding birds: evaluation of the effect and consideration in planning and managing road corridors. *Biodiversity and Conservation* 6 :567-781.

6.5.241. The main operational effects on invertebrates are those resulting from changes in management or disturbance of retained habitats, notably those associated with the Ardley Cutting and Quarry SSSI, and to a lesser extent the watercourses, hedgerows, field margins and other edge habitats. The sensitive long-term management of the green infrastructure will deliver a greater range and quantity of habitats suitable for a wide range of invertebrates across the Site, including species-rich calcareous grassland, lowland meadow and wetland habitats, hence will provide enhanced opportunities for the group, representing a **permanent, significant beneficial** effect at a **Local** level.

6.5.242. Runoff from roads has potential to result in localised pollution, which is particularly pertinent to invertebrates due to the sensitivity of this group to such impacts. The embedded drainage strategy has however been designed to ensure this risk is reduced and therefore effects will be **neutral**.

Otter

6.5.243. Otters are considered relatively sensitive to disturbance at their breeding sites but are capable of tolerating some disturbance from human populations in the vicinity of their far more extensive commuting routes and foraging areas[83]. The field data is consistent with the Ashgrove Brook and Gagle Brook corridors being used by otter at no more than very low levels, therefore as the presence of otters within the operational site is considered unlikely, other than on a very infrequent basis there is low likelihood of adverse effects.

6.5.244. Increased vehicle collision risk will act at the scale of individual animals and will likely have a disproportionate effect on the local population status of species such as otter that typically occur at low population densities within the landscape. Vehicle movements over the Gagle Brook will be elevated above the watercourse corridor however, and at the location of the road crossing over Ashgrove Brook the speed of site traffic will be limited.

6.5.245. In the absence of additional mitigation, operational effects to otter resulting from disturbance or direct harm are expected to be **permanent, not significant adverse** at a **Local** level.

6.5.246. The long-term management of the GI will promote the development of enhanced habitat corridors elsewhere within the site, including woodland and

[83] Chanin, P. 2003. *Ecology of the European Otter*. Conserving Natura 2000 Rivers, Ecology Series. No. 10. English Nature.

grassland buffers alongside existing riverine corridors and a broad GI corridor to the south of the Main Site encompassing grassland, scrub, woodland stands and vegetated SuDS, that will provide suitable cover and shelter for otters, enhancing connectivity through the local landscape and providing a **permanent, not significant beneficial** local level effect.

Hedgehog

6.5.247. Operation of the Proposed Development will result in an increased risk of hedgehog mortality due to vehicle collisions. Whilst the effect of roads upon local population status is uncertain[84], within the context of the declining status of the species it is considered reasonable to assume that there is potential for this to undermine the conservation status of the local population. The sensitive management of the on-site green infrastructure will however counter this by delivering improved habitat structure and connectivity that will improve the carrying capacity of hedgehog habitats in the long-term. The operation of the site will result in a **neutral** effect of hedgehog mortality due to traffic, and a **not significant beneficial effect** to local hedgehog populations via the long-term protection and management of the green infrastructure for biodiversity.

Polecat

6.5.248. There is similarly potential for operational of the site to affect status of polecat, if present, via an increased risk of mortality of individuals due to site traffic. Such effects are expected to be minimal, given this is a relatively mobile species and that a speed limit will be imposed on site traffic (**neutral** impact).

6.5.249. As above, management of the green infrastructure will deliver improved habitat structure and connectivity that will improve the carrying capacity of polecat habitats within the Application Site in the long-term. The effect long-term on the species, if present locally, will be **not significant beneficial**.

Summary of Operational Phase Effects

6.5.250. Table 6.15 summarises likely effects on ecological receptors during the operational phase with embedded mitigation in place, but in the absence of additional mitigation.

[84] Moore, J. L., Petrovan, S. O., Baker, P. J., Bates, A. J., Hicks, H. L., Perkins, S. E. and Yarnell, R.W. 2020. Impacts and Potential Mitigation of Road Mortality for Hedgehogs in Europe. *Animals* 10:1523.

Table 6.15: Operational Impacts (before any additional mitigation)

Ecological Receptor / Ecological Importance	**Summary of Effect**		**Level of Effect**
Oxford Meadows SAC **International Level**	Degradation of habitats from air pollutants generated by operational traffic.		Neutral
Ardley Cutting and Quarry SSSI **National Level**	Degradation of habitats from air pollutants generated by operational traffic.	NO_X	Neutral
		NH_3	Permanent, not significant adverse
		Nitrogen	
		Acid	
	Hydrological impacts		Neutral
	Increased recreational use of Ardley Fields Quarry Nature Reserve and due to use of new bridleway resulting in trampling, nutrient enrichment.		Permanent, not significant adverse
	Lighting impacts to foraging/committing and roosting bats		Permanent, neutral to not significant adverse
Ardley Road Verge Nature Reserve, Ardley Field Quarry LWS **County Level** Neighbouring **Local Level** Sites	Increased recreational use causing trampling, nutrient enrichment and littering		Permanent, not significant adverse
Unnamed Trixax Park Oxford AW	Degradation of habitats from air pollutants generated by operational traffic	NO_X	Permanent, not significant adverse
Ardley Fields Quarry LWS, Unnamed Trixax Park Oxford AW, and across parts of Ham Home-cum-Hamgreen Woods SSSI, Shabbington Woods Complex SSSI, Trow Pool LWS		NH_3	Permanent, not significant adverse
Burntwood Copse AW		Nitrogen	Permanent, not significant adverse
Shabbington Woods Complex SSSI Burntclose Copse AW, Ardley Fields Quarry LWS, Trow		Acid	Permanent, not significant adverse

Ecological Receptor / Ecological Importance	**Summary of Effect**	**Level of Effect**
Pool LWS, Unnamed Trixax Park Oxford AW		
Sites included within the AQA but not listed above	Degradation of habitats from air pollutants generated by operational traffic	Neutral
Other ecological sites and habitats sensitive to air quality	Degradation of habitats from air pollutants generated by increased diesel train journeys	Neutral
Trackway Adjacent to The Gorse pDWS **Local Level**	Increased recreational pressure – trampling, nutrient enrichment and littering.	Neutral
Veteran Tree **National Level**	T150 and T152 and retained BNG veteran trees will be managed sympathetically in the long-term. Veteran tree T170 will be retained within off-site third-party land with no public access. Relocation of cut veteran material to create a deadwood reserve adjacent to off-site ancient woodland/ on-site retained established woodland.	Neutral
GI habitats **Local – County Level**	Retained and newly created habitats including grassland, hedgerows and woodland will be placed into sympathetic long-term management.	Long-term not significant beneficial
	Visitor pressure effects on newly created and retained habitats e.g. nutrient enrichment from dog faeces, erosion from informal paths / heavy footfall.	Permanent, not significant adverse
Basil Thyme **County Level**	Long-term management	Permanent, not significant beneficial
Meadow clary **County Level**	Long-term monitoring and management	Permanent not significant adverse
Badger **Local Level**	Increased levels of badger mortality in association with road traffic collision.	Permanent, not significant adverse
	Management of GI for biodiversity	Long-term not significant beneficial
Overall Bat Assemblage **Local Level**	Increase in mortality rates due to severance of flight lines by new roads: Gagle Brook Wider Site	**Permanent, significant adverse** Permanent, not significant adverse

Ecological Receptor / Ecological Importance	**Summary of Effect**	**Level of Effect**
	Lighting impacts to foraging/committing and roosting bats across the operational site.	Permanent, neutral to not significant adverse
	Management of GI for biodiversity	Long-term not significant beneficial
GCN **County Level**	Barriers to dispersal	Permanent, neutral to not significant adverse
	Management of GI for biodiversity	Long-term **significant beneficial**
Reptiles **Local Level**	Barriers to dispersal	Permanent, neutral to not significant adverse
	Management of GI for biodiversity	Long-term not significant beneficial
Birds **Local to County Level**	General disturbance effects to sensitive species from the operation of the site	Permanent, not significant adverse
	Disturbance and direct harm to farmland birds due to recreational activity within/adjacent to GI	Permanent, **significant adverse**
	Noise disturbance close to affected roads Breeding birds and wintering birds	Permanent, not significant adverse to **significant adverse**
	Management of GI for biodiversity	Long-term not significant beneficial
Invertebrates **Local Level**	Management of GI for biodiversity	Long-term beneficial
	Impacts to habitats as a result of localised pollution / run-off	Neutral
Otter **County Level**	Increased hazards to movement through the areas of created habitat, including roads (traffic).	Permanent, not significant adverse
	Management of GI for biodiversity	Long-term not significant beneficial

Ecological Receptor / Ecological Importance	Summary of Effect	Level of Effect
Hedgehog **Local Level**	Increased hazards to movement through the areas of created habitat, including roads (traffic and drainage).	Neutral
	Management of GI for biodiversity	Long-term not significant beneficial
Polecat **Local Level**	Increased hazards to movement through the areas of created habitat, including roads (traffic).	Neutral
	Management of GI for biodiversity	Long-term not significant beneficial
Likely significant effect identified in **bold text**.		

6.6 ADDITIONAL MITIGATION AND RESIDUAL EFFECTS

Additional Mitigation

6.6.1. Many significant adverse effects have been avoided or reduced through the intrinsic Proposed Development design and embedded mitigation measures during construction and operational phases, and as shown above, many adverse impacts overall have been minimised or avoided altogether in the operational phase. This section identifies the additional mitigation measures required to further prevent, avoid, reduce or offset the potential for adverse effects and/or ensure legal compliance, with the outcome of such interventions summarised in Table 6.16: *Assessment Summary and Residual Environmental Effects*.

6.6.2. Where the likely effects are considered to be neutral or not significant these are considered 'not significant' in terms of the EIA Regulations, and no mitigation is required. As good practice however mitigation is proposed for non-significant adverse impacts where this can be reasonably achieved within the development, particularly for IEFs considered important at a geographic scale above Local level and those prioritised within local policy.

Construction Phase

6.6.3. This section identifies actions or measures to be implemented during construction to ensure key retained ecological habitats are protected from construction impacts. These are to be implemented in addition to the embedded (standard, best practice) measures specified within the CEMP,

HMMP and Natural England licencing requirements, including precautionary working methods and adherence to relevant pollution prevention procedures.

Sites with a Statutory National Nature Conservation Designation

Ardley Cutting and Quarry SSSI

6.6.4. Over and above the embedded mitigation the following working procedures will be implemented to further mitigate anticipated short-term impacts and permanent loss of SSSI calcareous grassland and lowland meadow habitats from Ardley Cutting and Quarry SSSI.

- Additional creation and long-term management (80 years) of substantial areas of calcareous grassland and lowland meadow (totalling c.15.44ha and 5.17ha respectively) is proposed within the on-site green infrastructure. These will be located in the close vicinity of the SSSI and will far exceed in area similar habitats removed from within the SSSI.
- To ensure the retained habitats are not accidentally damaged and to avoid accidental incursion, appropriate protective fencing will be introduced based on best practice guidance.
- Minimising habitat loss by keeping construction zones as small as possible in the SSSI;
- Translocation of calcareous grassland and supporting soils from within the development footprint to suitable receptor sites within the on-site GI, with receptor areas exceeding in extent the areas directly lost. A framework methodology is provided within the HMMP and detailed procedures will be included within the relevant P-HMMP/s.

6.6.5. The above proposals will create substantially more calcareous grassland and lowland meadow habitat than the quantity lost, representing more than 30-fold increase in calcareous grassland, and over 250 times more lowland meadow within the Application Site.

6.6.6. 11.56ha of the additional calcareous grassland will compensate the loss of SSSI habitats at a ratio of 4ha of calcareous grassland provided for every hectare of SSSI habitat lost (regardless of composition or quality), i.e. a four-fold increase in provision over that agreed during initial discussions with Natural England during the project design phase.

6.6.7. Detailed habitat creation prescriptions will be included within the appropriate P-HMMP/s to ensure the grassland establishes well, and that suitable remedial action is undertaken promptly should it be required. Locally sourced green hay from appropriate grassland sites will be utilised where possible[85]. These areas will additionally receive translocated grassland soils from the development footprint within the Ardley Cutting and Quarry SSSI (the soils are considered too friable to enable the translocation of turfs) and will be further supplemented with common dog-violet *Viola riviniana* and/or hairy violet *Viola hirta* to encourage dark green fritillary, in line with LNRS strategy PM215 (Create or enhance suitable flower-rich grassland habitats with plentiful populations of violets and light patches of scrub).

6.6.8. Given the significant extent of calcareous grassland creation proposed it is anticipated it will be necessary to additionally obtain a suitable proprietary seed mix to supplement the above sources. This will comprise a high-quality species-rich mix such as EM6 Meadow Mixture for Chalk and Limestone Soils and/or EM18 St Catherine Meadow Mixture. Lowland meadow areas will be established using green hay (where available) and/or a proprietary species-rich native Lowland Meadow mix as detailed within the HMMP.

6.6.9. The creation and long-term appropriate management of species-rich grasslands will enhance resilience of priority grassland communities associated with the Ardley Cutting and Quarry SSSI by sustaining larger populations locally and by providing opportunities for gene flow onto retained SSSI habitats. Further biodiversity benefits will be achieved for local fauna including farmland birds and several of the target butterfly species listed within the SSSI citation.

Habitats

6.6.10. The HMMP (Appendix:6.11) is informed by the outcome of the BNG assessment and specifies the phased establishment of green infrastructure and confirms the detailed short- and long-term management measures for retained and created habitats. It additionally provides a framework of specific habitat condition outcomes with expected time frames to obtain these. As such the HMMP will ensure that the Proposed Development continues to form part of both strategic and local green infrastructure networks.

6.6.11. To maximise the retention of existing structural habitats and associated biodiversity within the GI, impacted sections of important hedgerows will,

[85] Discussion is ongoing with Natural England to identify suitable grassland donor sites within Oxfordshire.

where sufficiently robust, be translocated to permanent new locations within the green infrastructure, in accordance with the methodology specified within the HMMP.

6.6.12. Sparsely growing sections of retained hedgerows will be 'gapped up' using native and fruit/nut-bearing species such as hawthorn *Crataegus monogyna*, hazel, field maple, blackthorn, and holly *Ilex aquifolium*. Management will aim to maintain continuous hedgerows, targeting 3-4m wide where conditions allow, with adjacent native grassland buffers

6.6.13. The composition of new woodland and shrub planting will be appropriate to establish species-rich habitats that reflect the diversity of local native woodland and hedgerows (see ES Chapter 7: LVIA, Appendix 7.5: Indicative Planting Schedule). Woodland planting will furthermore incorporate disease resistant cultivar elm *Ulmus* cultivars suitable to support white-letter hairstreak butterfly and therefore contribute to the Oxfordshire LNRS objectives for this species.

6.6.14. The permanent, **significant beneficial** construction effect on calcareous grassland habitat at the local level will be further enhanced via the translocation of calcareous grassland and supporting soils from within SSSI working areas to prepared receptor sites and the supplementation where possible using locally sourced green hay from appropriate calcareous grassland sites.

6.6.15. Should a licence be required to enable the translocation of meadow clary plants, the opportunity will be discussed with Natural England for the terms of the licence to also permit new meadow clary plants to be grown from mature seed collected from the existing population within the Ardley Road Verve Nature Reserve to provide a back-up to maintain the genetic stock should translocation fail and/or provide a larger number of plants overall for translocation and providing a **not significant beneficial effect**. Seed-grown plants would be planted out from the spring after the second year of growing on into on-site calcareous grassland receptor areas to increase the local population.

6.6.16. To compensate for the loss of T93 and of trees qualifying as veterans under the Biodiversity Gain Requirements (Irreplaceable Habitat) Regulations 2024 a bespoke Veteran Tree Strategy will be implemented to ensure cut veteran material is retained within the site and appropriately managed such that there is no net loss of material from the site and that arisings continue to contribute

to the local deadwood and veteran tree resource (see Appendix 4 of the HMMP). The CEMP furthermore specifies precautionary working methods to be adhered to in order to avoid direct and indirect harm to retained veteran trees during construction, including details of barriers or signage to be deployed as appropriate.

6.6.17. Deadwood identified elsewhere within the Application Site during site clearance will where possible also be retained within/adjacent retained woodland and hedgerows to provide further enhancement for saproxylic invertebrate assemblages and other fauna associated with such habitat. Trunks and limbs over 10cm in diameter and 1m in length should be prioritised for this purpose, provided either at ground level or as standing deadwood.

6.6.18. With the implementation of the above the effect of habitat on the veteran tree resource would be reduced to **not significant adverse**.

Gagle Brook

6.6.19. As requested by the OCC/CDC during the Round 2 consultation consideration was given to the option of installing an open-span bridge at the point at which the Middleton Stoney Relief Road will cross the Gagle Brook. Given the curvature of the brook at this location however the bridge would require an impracticably wide span to avoid the bridge foundations intruding into the watercourse or being positioned in close proximity to it.

6.6.20. In view of this constraint an oversized box culvert is instead proposed at this crossing point. This will have dimensions 6m(w) x 3.8m(h) inclusive of an invert level set c.0.3m below the existing bed level and will include a reinstated soft bed. The design will therefore maintain aspects of the watercourse morphology including natural sediment movement and the ability of associated fauna to navigate along the channel, as such the impact on brook habitats will be reduced to a **permanent, not-significant adverse** impact on this County level receptor.

6.6.21. Natural England have confirmed that provision of an underpass is their preferred mitigation for the maintenance of existing barbastelle bat commuting corridors at proposed road crossings (see Appendix G of Appendix ES6.3: Bat Report).

Habitat Fragmentation – Gagle Brook Corridor

6.6.22. The provision of an over-sized culvert along the brook section underneath the Middleton Stoney Relief Road will act as an underpass and promote functional connectivity and counter fragmentation effects for a range of mobile species in addition to bats, by enabling safe passage beneath the road. The underpass will additionally enable the movement of seeds and pollen via wind, water and animal-based transport.

6.6.23. The permanent fragmentation of the Gagle Brook woodland corridor will be further mitigated via the creation and maintenance of numerous alternative habitat linkages to existing areas of woodland and to retained or new hedgerows within the immediate area and corresponding enhancement of habitat connectivity where feasible (such as via the gapping up of hedgerows, promotion of a more diverse species composition and enabling hedgerows to increase in height and width), suitable to facilitate the continued movement of woodland species through the wider landscape. New woodlands will wherever possible be linked and existing retained woodland such that the permanent gap created within the Gagle Brook corridor is not critical to habitat connectivity across this section of the Site or surrounding landscape.

6.6.24. The planting mix will be representative of local native broadleaved woodlands and will include species such as English oak *Quercus robur*, beech, aspen *Populus tremula*, wild cherry *Prunus avium*, hybrid black poplar *Populus x canadensis*, small leaved lime *Tilia cordata*, field maple, hazel, hawthorn, and where feasible, disease resistant cultivar elm *Ulmus* cultivars. A smaller component of mixed woodland will additionally be established that will further contribute to increased habitat diversity across the Site. Low density woodland buffer planting at the margins of retained and created woodland blocks along the Gagle Brook corridor and elsewhere through the Site will create transitional zones between woodland and more open grassland habitats, providing complementary habitat connectivity, enhancing woodland edge structure and buffering woodland interior habitats from the effects of road traffic, including impacts arising due to elevated noise, aerial/particulate pollutants and light pollution.

6.6.25. The P-HMMP/s will specify the detailed management provisions for areas of woodland planting and retained habitats to encourage the development of structurally diverse, inter-connected woodlands of high biodiversity value suitable to support local flora and fauna and encourage dispersal, further reducing the adverse effects of habitat fragmentation and isolation.

6.6.26. With the implementation of the above, residual construction impacts on the Gagle Brook woodland habitats will non-significant adverse in the long-term

as the landscaping matures. Impacts to the majority of species with limited dispersal capabilities will be **not significant adverse to significant adverse** in the short- to medium term, dependant on dispersal abilities, but **neutral to non-significant adverse** in the long-term.

6.6.27. Similarly, once the soft landscaping is established and long-term sensitive management measures are implemented, operational effects will be **not significant adverse** for woodland habitats and associated fauna.

Notable Plants

Basil Thyme (if necessary to translocate)

6.6.28. Whilst no losses of basil thyme plants are anticipated, grassland habitats close to the species record location will be subject to assessment by an ecologist during the growing season prior to commencement of construction works in the area. Should basil thyme be identified present within the works areas, appropriate receptor sites of sufficient size to enable a translocated population to expand will be identified within neighbouring established/ establishing calcareous grassland within the on-site GI.

6.6.29. Given basil thyme is usually an annual species (but can also be a short-lived perennial)[86], translocation of individual plants is unlikely to provide a feasible mitigation strategy. Plants will therefore be moved with associated soils to ensure that the seedbank, which is critical to enable the population to persist, is also translocated. This translocation could be undertaken as part of more extensive translocation of calcareous grassland from within sections of the SSSI prior to construction works within these areas. Appropriate translocation procedures would maintain the current basil thyme population within the local area, resulting in a neutral effect on this species.

6.6.30. Any basil thyme plants, associated soils and seedbank relocated to receptor sites will thereafter be subject to sensitive long-term management to maximise the likelihood of successful reestablishment, as specified within Appendix ES6:11: HMMP. With appropriate management an increase in basil thyme population size and distribution can be expected, with a concomitant greater surety for maintaining a sustainable population, resulting in a permanent, **not significant to significant beneficial** residual effect for this **County** level receptor.

[86] Plantlife. (undated). Basil Thyme *Clinopodium acinos* - Species Fact Sheet. Salisbury: Plantlife. https://www.plantlife.org.uk/download_file/view/2633/837

Meadow Clary (if necessary to translocate)

6.6.31. Whilst no direct loss of meadow clary plants is anticipated, there remains potential for the species to have colonised adjacent proposed development areas subsequent to the most recent survey. Therefore, as detailed within the HMMP an updating survey will be undertaken of habitats within and adjacent to the Ardley Road Verge Nature Reserve prior to construction commencing in the adjacent phase.

6.6.32. Should any meadow clary be present within the development footprint it will be translocated prior to the commencement of works to calcareous grassland habitat within the site GI during late winter or early spring (mid-February to mid-March) and avoiding working in frosty conditions as detailed within the HMMP. Receptor areas will be of sufficient size to enable the translocated population to expand.

6.6.33. Meadow clary is a Schedule 8 species therefore a licence from Natural England will be required to enable any translocation works.

6.6.34. Any translocated meadow clary plants will be managed in full accordance with methods detailed within the licence documentation that will be agreed and issued by Natural England prior to translocation being undertaken. The translocated population/s will furthermore be monitored annually for a minimum of three years post-relocation to assess the success of establishment and to establish whether there has been any natural population growth as a result of seed shed by the translocated plants. With appropriate management the number of meadow clary plants can be expected to increase and maintain a sustainable population across on-site grassland and potentially spreading to neighbouring SSSI habitats, resulting in a permanent **not significant to significant beneficial** residual effect on this species of **County level** importance.

<u>Fauna</u>

Bats

6.6.35. The installation of the large box culvert at the crossing point of the Middleton Stoney Relief Road over the Gagle brook will maintain an uninterrupted flight line suitable for use by all local bat species other than those that typically fly at considerable heights (such as noctule) and that would hence be relatively unaffected by small scale habitat fragmentation. The fragmentation effect on

the brook corridor introduced by the road construction would be reduced to an impact of **neutral** significance.

6.6.36. The culvert will furthermore encompass mammal shelves suitable to maintain connectivity for otter and other terrestrial/semi-aquatic fauna along this corridor.

Birds

Habitat Loss:

6.6.37. Additional habitat creation and enhancement is proposed across the two field parcels located to the north-west of the Application Site to compensate for grassland loss to the Proposed Development.

6.6.38. The larger of these compartments to the east will be taken out of arable use and converted to provide c.7.71ha species-rich lowland meadow grassland. Soil testing has shown that nutrient levels are suitable for habitat creation to commence without the need for a period of nutrient stripping (see Appendix 1 of the HMMP). This grassland will subsequently be managed under prescriptions sensitive to farmland and ground-nesting birds, such as the incorporation of seed-bearing seed mixes, maintenance of varied sward heights and areas of sparsely vegetated or bare ground, and restrictions on the timings of cutting to allow completion of each species' respective breeding cycle and ensure seed availability throughout the winter.

6.6.39. The smaller (c.6.44ha) field to the west will be sown with a seed-bearing cover crop mix to provide a complimentary winter foraging resource. This will be established between September and March following the provisions of Sustainable Farming Incentive (SFI) CAB12: Supplementary winter bird food and SFI CAHL2: Winter bird food on arable and horticultural land and will be maintained over winter until late March. The existing narrow margins will be widened and sown with a species-rich, tussock-forming grassland mix to provide further habitat diversity and foraging opportunities.

6.6.40. Beetle banks will additionally be established within the grassland margins of both fields and will be managed in accordance with Sustainable Farming Incentive AHW3: Beetle banks to provide further foraging and nesting opportunities for a range of bird species including skylark.

6.6.41. Suitable seed mix compositions and methods of habitat establishment and ongoing management each year are detailed within the Bird Report

(Appendix ES6.5) and HMMP (Appendix ES6.11), as are details of the beetle bank creation and long-term management.

6.6.42. The creation and long-term sensitive management of the open grassland in conjunction with the seed-bearing cropland provide high-quality foraging and nesting opportunities suitable to support priority farmland bird species, particularly nesting grey partridge, skylark, yellow wagtail, meadow pipit, corn bunting, and reed bunting, and elevate the overall carrying capacity of the Application Site for such species. This additional provision will thereby accommodate the continued presence of farmland birds displaced from within the developed areas of the site, including those temporarily displaced from the northern section of the landfill, and the wider local bird assemblage.

6.6.43. An area of green infrastructure to the southeast of the Main Site adjacent to the proposed Middleton Stoney Relief Road will additionally provide substantial structurally diverse habitats suitable to provide further on-site enhancement for generalist and farmland bird species. The mosaic of habitats will include species-rich grassland, native scrub and scattered individual tree standards suitable to increase niche availability and invertebrate populations and hence provide alternative foraging, shelter and nest sites that will particularly benefit species of scrub edge habitats such as linnet and yellowhammer in addition to corn bunting, warblers and greenfinch, whereas the grassland.

6.6.44. As specified within the HMMP any ‘gapping up’ of retained hedgerows will include native and fruit/nut-bearing species, including, but not limited to hazel, field maple, dog-rose, hawthorn, dogwood, honeysuckle *Lonicera periclymenum*, blackthorn, elder and holly to maximise the value of hedgerow habitat to wintering birds and a range of other local fauna.

6.6.45. With the implementation of the above additional mitigation habitat loss and replacement during the phased construction and creation of GI would result in a temporary **neutral to not significant adverse** effect on breeding farmland birds, replaced in the longer term by a **not significant beneficial** effect.

6.6.46. Wintering birds would similarly benefit from the additional habitat provision, resulting in a residual **temporary and not significant adverse effect**, replaced by a **not significant beneficial** effect as the green infrastructure matures.

Nest Sites:

6.6.47. The Proposed Development will result in the loss of one occupied barn owl nest site, the likely abandonment of an active roost site, and the loss of several areas where the species was incidentally encountered foraging. To preserve the population status of barn owl locally three barn owl boxes will be provided within the Application Site. Boxes will be situated close to the existing roost sites and also close to suitable foraging habitat in order to minimise the necessity for owls to cross highways and thus keep collision risk as low as feasible (see Appendix ES6.5: Bird Report for proposed barn owl box locations). The barn owl boxes will either be pole mounted or affixed to a suitably large and open retained mature tree standard, with boxes to be installed prior to commencement of works on-site to allow the resident barn owls sufficient time to locate the new provision before being displaced. Provision of barn owl boxes will deliver a local level long-term **neutral to not significant beneficial** effect for the species.

6.6.48. A variety of bird box designs suitable to support a range of local species will additionally be provided and will result in a local level long-term **neutral to not significant beneficial** effect for the generalist and urban edge bird assemblages. Suitable nest box types include, but are not limited to:

- A mix of small hole (26mm and 32mm) boxes among retained habitats suitable to provide nesting opportunities for species such as blue tit *Cyanistes caeruleus* and great tit *Parus major*.
- Small open-fronted nest boxes installed throughout the green infrastructure, especially on trees that support a climber such as ivy which provides a degree of concealment. These boxes typically attract species such as robin *Erithacus rubecula* and blackbird *Turdus merula*;
- Kestrel nest boxes installed at least 5m high on lone trees, buildings or pole-mounted, close to grassland areas where possible;
- Large nest boxes (c.20 x 20 x 40cm) with large holes (15cm) for stock dove installed in small groups at least 3m high on large trees in woodland edge habitats in areas of disturbance. Provision of nest boxes for urban birds, including house sparrow, swallow *Hirundo rustica*, and swift, including on the industrial units where feasible.

Operational Phase

Sites with a Statutory Nature Conservation Designation

Ardley Cutting and Quarry SSSI

6.6.49. A commitment is made to providing bespoke mitigation for impacts to SSSI qualifying habitats that includes the long-term (80 years) management of the calcareous grassland established to the immediate east/south-east of Kennel Copse, and lowland meadow within the adjacent field compartment to the north, as detailed within the HMMP ES Appendix ES6.11 (see also Figure 11 within Appendix ES6.9: Biodiversity Net Gain Assessment).

6.6.50. Adverse impacts to SSSI habitats arising as a result of elevated levels of airborne pollutants, such as minor alterations to habitat species composition, condition, or extent, will be compensated via the creation, long-term monitoring and appropriate management of these species-rich grasslands in close proximity to the SSSI such that they enhance the resilience of associated habitats and their carrying capacity to support notable flora and fauna. Provision of proportionate compensation in the form of habitat creation to address the harmful effects of air quality impact is in line with Natural England Standing Advice[87] which states "*Secure compensatory measures, need to fully offset the damage that will be caused to the site. Compensatory measures can include creating the same or very similar habitat on areas of little or no conservation value … at a suitable location outside the site*."

6.6.51. As detailed within the Construction Phase section above, 11.56ha of the above additional calcareous grassland is to be provided and sensitively managed in the long-term to compensate for the permanent loss of habitats from within the SSSI boundary. The remaining 3.88ha of new calcareous grassland and 5.17ha lowland meadow (9.05ha total) is allocated to the compensation of the anticipated operational influences on air quality and associated impacts on SSSI habitats identified within Section 6.5, the residual effect of which will be a **neutral** effect on this **National level** receptor.

Habitats

6.6.52. The effect of increased visitor pressure on newly created and retained habitats such as erosion via increased footfall or the use/creation of informal paths or impacts from nutrient enrichment from dog faeces will be reduced via the use of fencing or strategic planting to limit access to sensitive area or habitats, appropriate signage and information boards to promote public engagement with mitigation habitats, and provision of litter bins at strategic locations. These measures will reduce the impact of increased recreation

[87] https://www.gov.uk/guidance/habitats-regulations-assessments-protecting-a-european-site#derogation

access once the site is operational to **neutral to not significant adverse** significance at a **local** scale.

Fauna

Bats

6.6.53. To minimise the operational impact of increased mortality risk to foraging and commuting bats at the proposed road crossing over the Gagle Brook structural vegetation will be established to each side of the road structure to funnel bats towards the oversized box culvert underpass that will enable bats to avoid crossing over the road. Taking into account recently published literature that demonstrates the collision risk for barbastelle increases in areas with dense or overlapping canopy as a result of bats reducing the height at which they fly across roads in the presence of canopy cover[88] no structural planting will be established on the road embankments at the location of the brook corridor crossing. These will instead be maintained with a simple grassland sward only in order to encourage any bats that do fly over the carriageway to do so at a safe height. The maintenance of the underpass as above will reduce mortality risks introduced by the construction of the road crossing to an impact of **neutral to not significant adverse** significance.

Birds

6.6.54. Following establishment of the open grassland habitats additional mitigation to the northwest of the Main Site these areas will be managed under prescriptions sensitive to farmland and ground-nesting birds specified within the HMMP and subsequent phase-specific P-HMMPs including the maintenance of varied sward heights, some areas of sparsely vegetated and/or bare ground, and restrictions on the timings of cutting to avoid the main nesting season and ensure seed availability throughout the winter.

6.6.55. The seed-bearing crop established to the north-west of the Main Site to provide a complimentary winter foraging resource will be re-established annually in accordance with the prescriptions set out under Countryside Stewardship Grant AB9: Winter bird food, with appropriate crop rotations and sympathetic management for nesting and foraging birds.

[88] Scientific Reports 2025. *Increasing canopy cover elevates vehicle collision risk for barbastelle bats* (*Barbastella barbastellus*) *at roads*.

6.6.56. A long-term bird monitoring programme will be undertaken across the main open grassland mitigation areas as detailed within **Appendix ES6.11.** Field data will inform relevant feedback to ensure habitat measures specified within the HMMP and subsequent P-HMMPs are adapted as necessary should such monitoring determine that previously recorded bird assemblages no longer continue to breed or over-winter successfully on Site. Management interventions will target relevant associated habitats and may comprise additional mowing/grazing to break up sward density, the resowing of field compartment interiors or field margins to increase the availability of invertebrates and/or seeds, alteration of hedgerow cutting rotations to boost winter berry yields, or the removal of encroaching scrub providing predator perches. Any fencing alongside public footpaths noted to be in disrepair will be reported to the appointed Management Company for immediate repair/replacement

6.6.57. The above additional provisions will contribute to the overall green infrastructure enhancement for local bird assemblages; however the construction impact would remain as **not-significant beneficial**.

6.6.58. To minimise adverse impacts arising from increased recreational disturbance in close proximity to open grassland areas, footpaths have been routed close to the margins where possible. Additional mitigation will be provided during the construction phase comprising the installation of post and rail fencing is to be installed to either side and will include metal meshing to at least 50cm above ground to prevent dogs going through the fencing. Fencing will not include protruding posts that could be used for perching by raptors. The proposed area of farmland bird cover crop to support wintering farmland passerines most susceptible to the impacts of additional disturbance has been proposed for an area away from any proposed footpaths or access. Footpaths within farmland bird mitigation could include several raised viewing screens to promote public engagement with nature and if implemented should be accompanied by information boards detailing the mitigation works and what species are being benefitted. The additional mitigation as outlined above would reduce operational farmland birds to a permanent, **not significant adverse** effect.

Residual Effects

6.6.59. The assessment of residual effects considers the effects likely remaining after the implementation of the additional mitigation measures described above, in addition to those considered ‘embedded’ within the development

design. The following paragraphs capture the key conclusions regarding residual effects on the main sensitive receptors as summarised in Table 6.16.

Construction Phase

Sites with a Statutory National Nature Conservation Designation

6.6.60. No residual construction effects to Oxford Meadows SAC are anticipated (**neutral** effect).

6.6.61. With the proposed construction phase mitigation measures in place the residual effects on the qualifying features of Ardley Cutting and Quarry SSSI (lowland calcareous grassland and notable invertebrate assemblage including Duke Of Burgundy butterfly) would be a permanent **neutral to not significant beneficial effect** as a result of appropriate precautionary working methodologies and the beneficial effects resulting from the creation of extensive complimentary calcareous and lowland meadow grassland habitats in close proximity to retained SSSI habitats. The created GI will facilitate enhanced gene flow and enable larger, more resilient priority flora and associated faunal assemblages to be sustained locally.

6.6.62. Following the implementation of the proposed mitigation, residual impacts of construction effects on Ardley Cutting and Quarry SSSI including direct physical damage and indirect impacts operating via hydrological or airborne pathways will be temporary/permanent **neutral to not significant adverse**.

6.6.63. No significant adverse impact is anticipated to the conservation status of the Ardley Cutting and Quarry SSSI or any other statutory designated site.

Non-Statutory Sites of Nature Conservation Value

6.6.64. Following the implementation of the proposed mitigation, residual impacts on all non-statutory designated sites as a result of direct habitat loss, physical harm or indirect pathways including noise, hydrological impacts, airborne pollutants, dust or other pollution and will be **neutral to not significant adverse**, with the exception of **not significant beneficial** effects resulting from the creation of complementary green infrastructure where this will provide a physical buffer habitat buffer to non-statutory sites to airborne pollution and other edge effects, extend the coverage of representative priority habitats and/or provide a source of future gene flow/seed rain that will support the long-term continuation of such habitats.

6.6.65. No significant adverse impacts are anticipated to any non-statutory designated site.

Habitat

6.6.66. Native species greenspace provided as a combination of embedded and additional mitigation will in total extend across approximately 268ha or 60.3% of the Application Site. This will include native species woodland belts with woodland edge and scrub mixes created in association with species rich hedgerows and mixed grassland habitats and will buffer adjacent off-site priority habitats including Ardley Cutting and Quarry SSSI, local sites and adjacent ancient woodland, and enhance connectivity between the site and off-site habitats.

6.6.67. With the proposed mitigation and compensation measures in place there will be a residual permanent **significant beneficial effect** on calcareous grassland and lowland meadow habitats, both habitats of ecological importance at a national level.

6.6.68. Permanent **not significant beneficial** effects are anticipated for lowland deciduous woodland and hedgerow habitats (County level importance) and to other semi-natural woodland, other neutral grassland, and Ashgrove Brook and tributaries (Local level). The Padbury Brook tributary will be subject to a **neutral to not significant adverse** residual effect following realignment and associated habitat creation, and the Gagle Book a **not significant adverse** residual effect due to the installation of a large box culvert along the section under the proposed route of the Middleton Stoney Relief Road.

6.6.69. Existing habitats retained within the Application Site will be appropriately protected from construction works and many will be buffered within the on-site GI. As a result, retained habitats will experience a **neutral to not significant beneficial** effect.

6.6.70. Temporary, not significant adverse effects to local basil thyme and meadow clary populations as a result of dust generation during construction. Impacts acting via other indirect pathways, or as a direct consequence of habitat loss will be neutral, however should it be necessary to obtain a licence for the translocation of meadow clary then the opportunity will also be explored with Natural England to include within the licence the collection and growing on of seed from existing plants to bolster the translocated population during the phased GI creation, resulting in a **not-significant beneficial** effect locally.

Fauna

6.6.71. Overall, whilst there will be extensive habitat loss from the Application Site during construction, adherence to appropriate precautionary working procedures (embedded CEMP and Natural England licences) and the phased creation of green infrastructure as part of each construction phase will maintain most faunal IEF species and assemblages present locally, with residual effects ranging from **temporary/permanent not significant adverse** to **not significant beneficial** for most faunal groups.

6.6.72. No significant adverse residual effects on IEF fauna are anticipated, however local level **significant beneficial effects** will act on GCN and on terrestrial invertebrate populations, specifically those associated with species-rich meadow, calcareous and other neutral grassland and grassland to shrub / woodland transition zones, including target butterfly species listed within the Ardley Cutting and Quarry SSSI citation: brown hairstreak, dark green fritillary, Duke of Burgundy, small blue, white admiral, and white-letter hairstreak

Operational Phase

Sites with a Statutory National Nature Conservation Designation

6.6.73. No residual operational effects to Oxford Meadows SAC are anticipated (**neutral** effect).

6.6.74. As detailed within the SSSI HMMP, a commitment is made to providing bespoke mitigation for the loss of qualifying habitats from the Ardley Cutting and Quarry SSSI that includes the long-term (80 years) sensitive management of the proposed calcareous grassland field immediate east/south-east of Kennel Copse, and lowland meadow adjacent to the north provided within the on-site GI for this purpose (see Figure 11 within Appendix ES6.9: Biodiversity Net Gain Assessment). Habitat monitoring and condition assessment undertaken in accordance with the specifications of the HMMP.

6.6.75. The appropriate management of the extensive calcareous grassland lowland meadow created in close proximity to the SSSI will enhance the resilience and carrying capacity of the SSSI habitats to support notable flora and fauna and compensate the effects of airborne pollutants from the operational SRFI, specifically via NO_X, NH_3, nitrogen and acid deposition, resulting in a **neutral** residual effects on the SSSI and associated habitats and fauna.

6.6.76. A residual **permanent not significant** effect from increased recreational access of the Ardley Woods component of the SSSI is anticipated following the enhancement of the local right of way network and provision of additional mitigation comprising the strategic use of fencing and/or planting to discourage the creation of new access points, and the provision of appropriate signage, information boards and litter bins at on-site locations adjacent to the footpath.

6.6.77. A **neutral to not significant adverse** effect will result from the lighting of the operational SRFI, following implementation of a sensitive lighting strategy designed to avoid or otherwise minimise the artificial lighting of habitat corridors and associated green infrastructure.

Non-Statutory Sites of Nature Conservation Value

6.6.78. Following the implementation of the proposed mitigation, residual impacts on Ardley Road verge Nature Reserve and on Ardley Field Quarry LWS as a result of increased recreational access will be **neutral to not significant adverse**.

6.6.79. Residual effects on non-statutory sites resulting from airborne pollutants comprise **not significant adverse** effects to the following sites: Unnamed Trixax Park Oxford AW (NO_X); Ardley Fields Quarry LWS, Unnamed Trixax Park Oxford AW, and across parts of Ham Home-cum-Hamgreen Woods SSSI, Shabbington Woods Complex SSSI, Trow Pool LWS (NH_3); Burntwood Copse AW (nitrogen deposition), and Shabbington Woods Complex SSSI Burntclose Copse AW, Ardley Fields Quarry LWS, Trow Pool LWS, Unnamed Trixax Park Oxford AW (acid deposition).

6.6.80. Direct and indirect operational effects on all other non-statutory will have **neutral** significance.

Habitat

6.6.81. The long-term management of on-site habitats will result in a **not significant beneficial** effect on retained and created habitats within the on-site green infrastructure as these habitats mature and make an increasing contribution to local level biodiversity.

6.6.82. With the proposed mitigation and compensation measures in place there is however potential for localised damage and a **not significant adverse** effect on semi-natural woodland habitats as a result of recreation access.

Recreation effects to other habitats throughout the remainder of the on-site green infrastructure would have **neutral** significance.

Fauna

6.6.83. The long-term management of on-site habitats during the operation of the site will deliver overall benefits in terms of enhanced foraging, shelter, nesting/roosting and commuting opportunities for a wide range of local fauna including priority species and groups, including a **not significant benefit** to local badger, bats, reptiles, birds, invertebrates, otter, and hedgehog, and to polecat and hazel dormouse if present locally (currently presumed absent). A significant benefit is anticipated for the local GCN metapopulations as a result of the long-term management of high-quality terrestrial and aquatic habitats and associated enhanced opportunities for range expansion and dispersal.

6.6.84. **Not significant adverse** effects are predicted for local badger clans in terms of the increased risk of mortality on the local road network as a result of more traffic journeys, including out of hours deliveries to/from the SRFI.

6.6.85. A **neutral to not significant adverse** effect to local bat populations is similarly anticipated due to an increased risk of collision with traffic as a result of the operation of the site, and a further **neutral to not significant adverse** effect of lighting required across the site.

6.6.86. The localised fragmentation of the on-site green infrastructure by access roads and other built development will maintain a **not significant adverse** effect on local GCN and reptile populations where such structures form a permanent barrier or partial barrier to the movement of these species that have relatively limited dispersal capability.

6.6.87. Disturbance from the operation of the SRFI will sustain a **neutral to not significant adverse** effect to local bird assemblages generally and will prevent the recolonisation of the site by species sensitive to disturbance. Where footpaths and other forms of recreation access have potential to bring pedestrians and riders into close proximity to the open grassland and cropland habitats maintained within the on-site GI these will result in a **not significant adverse** effect, largely centred on the right of way network. A effect of up to **not significant adverse** severity will also act on bird assemblages throughout the local area as a result of the increased volume of traffic on the immediate road network.

Climate Change

6.6.88. Predicting potential impacts on habitats, species and ecosystems arising from climate change with any certainty is difficult because of the complexity, and dynamic nature of existing relationships between species and their habitats, and the adaptability of some species to general change. This is compounded further by the interaction with climate change of non-climatic processes such as habitat loss and fragmentation, water abstraction, nutrient enrichment and pollution, which reduce the resilience of species and ecosystems[89].

6.6.89. However, increased temperature and changes in precipitation levels have the potential to result in alterations with habitats suited to warm dry conditions advancing northwards and habitats of cooler and wetter conditions retreating northwards. Generally, there will be a consequent adaptation of species associated with those habitats, and species will correspondingly move with this habitat shift, but loss of some species is likely, particularly when climatic conditions for species become unfavourable irrespective of habitat shift. In terms of overall biodiversity this may not necessarily result in a reduction of biodiversity with new arrivals and subsequent expansion of species adapted to warm conditions. Within the lifetime of the Proposed Development, these effects are unlikely to be discernible at a local level and unlikely to alter the ecological baseline. This is due to the absence (both pre and post development) of habitats onsite that are most at risk from climate change including montane, coastal, peat bog and other wetland habitats[90] and their associated species.

6.6.90. A key feature identified as being important to assist the resilience of biodiversity features to climate change is the development and maintenance of a functional network of linked habitats at landscape level to aid species movement in response to climate change[91]. This should be achieved by a variety of means: protection of existing habitats, enhancement of habitat diversity, and the creation of new habitats to provide 'stepping stones' between important habitats for species.

[89]Bednar-Friedl, B., R. Biesbroek, D.N. Schmidt, et al. 2022: Europe. In: Climate Change 2022: Impacts, Adaptation and Vulnerability. Contribution of Working Group II to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change (H.-O. Pörtner, D.C. Roberts, M. Tignor, E.S. Poloczanska, K. Mintenbeck, A. Alegría, M. Craig, S. Langsdorf, S. Löschke, V. Möller, A. Okem, B. Rama (eds.)). Cambridge University Press, Cambridge, UK and New York, NY, USA, pp. 1817–1927.
[90]Biodiversity Climate Change Impacts Report Card 2015
https://nerc.ukri.org/research/partnerships/ride/lwec/report-cards/biodiversity/
[91] Tyldesley, D. 2009. Climate change and biodiversity adaptation: the role of the spatial planning system. Natural England Commissioned Report, Number 004.

6.6.91. Whilst the Proposed Development will result in the loss of habitat, within a SSSI and designated LWS, the development design ensures habitat linkage is maintained between retained areas of woodland and other features within the adjacent landscape that are considered important as connecting habitat, principally this is the existing railway corridor and adjacent woodland blocks, included the riparian woodland along Gagle Brook.

6.6.92. Compensatory planting throughout the Application Site will result in large areas of woody habitat creation. This increase in tree cover will increase carbon sequestration with a subsequent contribution to broader climate change targets.

6.6.93. The proposed habitat creation and enhancement also provide extensive opportunities for species which are currently represented on site (with the exception of some farmland bird species) as well as providing opportunities for additional species to colonise. The creation of extensive, connected and robust habitats for a range of species will help negate some negative impacts of climate change in other areas outside of the development proposals, such as bat and bird species associated with native woodland, or species of wet grassland habitats including GCN and other amphibians, and wetland invertebrate assemblages).

6.6.94. Gagle Brook and its tributary Ashgrove Brook may be susceptible to changes in flood regime and surface run-off (further assessed in Chapter 9). Any increase in summer drought condition has the potential to lead to a decline in wet grassland communities including rush pastures and water meadows, neither of which were identified within the baseline habitats, though a wet tolerant grassland mix is proposed to be used around the attenuation basins.

6.6.95. The HMMP stipulates that the management of the created / enhanced habitats on site is regularly reviewed and adapted to ensure the establishment of healthy robust habitats. For example, newly planted hedgerows and trees may require more or less watering during establishment than standard guidelines advise. In addition, projected changes in rainfall will need to be taken into consideration during the detailed design of attenuation basins to prevent flooding and also to provide water supplies in drought conditions. In a warmer climate the maintenance of aquatic habitats within the site may become more important for species if natural water sources in the wider landscape become scarcer.

6.6.96. The provision and ongoing management of robust connected habitats will provide opportunities for a range of species and allow natural colonisation

and changes in distribution to occur. Regular management reviews (which form part of the HMMP) will be undertaken to ensure resilient habitats and ecosystems on site which will enable species to naturally adapt to climate change. It is therefore not considered that the species and habitats identified on site are particularly susceptible to the effects of climate change or would be substantially impacted by or vulnerable to such changes, resulting in a **not significant, adverse** to **neutral** effect.

Human Health

6.6.97. The mitigation for the construction phase of the Proposed Development will ensure the effect of the Proposed Development during habitat removal on the health and safety of construction workers, downstream water sources and subsequently on human health will be **neutral**. Proposed measures included in the CEMP include, but are not limited to, measures to prevent potential contaminants entering waterbodies, proposals to avoid mobilisation of sediments into waterbodies, working practices to protect construction workers near waterbodies and protected species such as badger which can show aggression when disturbed and bats which carry the SARS 2 virus. All works in the vicinity of badger setts will be undertaken under the supervision of a ECoW and all works in the vicinity of known bat roosts will be undertaken under the supervision of a vaccinated licenced bat worker.

6.6.98. The mitigation embedded within the design for the Proposed Development during the operational period will include the retention and enhancement and creation of new areas of species-rich grassland, woodland, tree and shrub planting in the vicinity of new and upgraded PRoW, cycleways and bridleways. As discussed above, these habitats will support a range of fauna and there is much evidence that wildlife-rich environments and nearby greenspace benefits both physical and mental health and can have a positive influence on wellbeing. The GI will provide both an aesthetic resource for walking and cycling and a place to observe the species it attracts. Therefore, the Proposed Development provides opportunities for up to a **significant beneficial** residual effect on human heath for the future operational staff the OxSRFI and local residents who may use the PRoW/cycleways.

Mitigation Summary

6.6.99. Construction will follow best practice to manage environmental change, including alterations in noise, dust, water quality and lighting. All retained habitats will also be protected, for example through the use of fencing around root protection areas. As the construction will take a number of years ecology

surveys will be updated ahead of each phase of construction so that the most up to date information is available.

6.6.100. Some sections of the more important hedgerows will be impacted, and to prevent their loss they will where suitably robust be moved and retained (including translocation) in the green infrastructure areas. Where habitat clearance is necessary it will be timed to avoid the most sensitive periods, for example the bird nesting season. Where this isn't possible special working methods will be used, including monitoring of wildlife activity, to ensure legal compliance. Where appropriate this will include the use of protected species licenses from Natural England. This will also deliver replacement habitat for the affected species, including badgers, roosting bats and GCN.

6.6.101. Lost habitats will be replaced and together with the retained habitats will be managed as part of the green infrastructure. This will focus on maintaining and improving upon the network of habitats present, particularly the calcareous grassland, lowland meadow, other neutral grassland, woodland, hedgerows, trees, ponds and watercourses. Where required, habitat landscaping, fencing and mammal tunnels will help protect species from accidental harm (for example, from vehicle collisions) and retain the important habitat connections that enable wildlife to move around the landscape.

6.6.102. The Proposed Development will also deliver in excess of 10% Biodiversity Net Gain, despite not being mandatory, but to reflect best practice and to maximise mitigation benefits.

6.6.103. Table 6.16 sets out the detail of the identified likely residual effects on all relevant receptors.

Table 6.16: Assessment Summary and Residual Environmental Effects (Ecology)

Ecological Receptor / Ecological Importance	Summary of Effect	Level of Effect	Additional Mitigation	Residual Effect and Significance	Mechanism by which Secured
Construction					
Oxford Meadows SAC **International Level**	Degradation of habitats via air pollution	Neutral	-	Neutral	-
Ardley Cutting and Quarry SSSI **National Level**	Direct loss of calcareous grassland/neutral grassland/lowland meadow/scrub	Permanent significant adverse	Bespoke habitat creation and long-term sensitive management of extensive calcareous grassland and lowland meadow habitat adjacent the SSSI. Use of appropriate protective fencing to protect retained habitats Keeping construction zones within the SSSI as small as possible. Translocation of grassland and soils from the SSSI working areas to neighbouring receptor sites to retain within new species-rich grassland.	Permanent, neutral to not significant beneficial	CEMP / HMMP
	Degradation of habitats via hydrological pathways: surface water/groundwater	Permanent, not significant adverse	-	Permanent, not significant adverse	Site drainage design
	Degradation of habitats via hydrological pathways: Gagle Brook, Padbury Brook	Neutral	-	Neutral	CEMP
	Physical damage to SSSI habitats	Permanent, not significant adverse	-	Permanent, not significant adverse	CEMP

Ecological Receptor / Ecological Importance	Summary of Effect	Level of Effect	Additional Mitigation	Residual Effect and Significance	Mechanism by which Secured
	Degradation of habitats from dust generated by construction traffic.	Temporary not significant adverse	-	Neutral	CEMP / HMMP
	Degradation of habitats from construction pollution events.	Temporary not significant adverse	-	Temporary not significant adverse	CEMP
	Degradation of habitats from air pollution generated by construction traffic, specifically airborne NO_X and NH_3	Neutral	-	Neutral	-
	Degradation of habitats from air pollution generated by construction traffic, specifically Nitrogen deposition and Acid deposition	Temporary neutral to not significant adverse	-	Temporary, neutral to not significant adverse	-
Other statutory and non-statutory ecological sites	Degradation of habitats via hydrological pathways	Neutral	-	Neutral	Site drainage design
Upper Hayfield Airfield LWS **County Level**	No habitat loss, beneficial soft landscape buffering	Permanent, not significant beneficial	-	Permanent, not significant beneficial	HMMP
	Indirect impacts: disturbance, physical damage, pollution etc.	Neutral	-	Neutral	CEMP
Ardley Fields Quarry LWS **County Level**	No habitat loss. Degradation of habitats from air pollution generated by construction traffic	Neutral	-	Neutral	-
Ardley Road Verge Nature Reserve	Habitat loss, beneficial soft landscape buffering	Permanent, neutral to not significant beneficial	-	Permanent, neutral to not significant beneficial	Planting scheme / HMMP
Ardley Fields Pond East LWS Ardley Fields Pond West LWS Trow Pool LWS Stoke Wood LWS	No habitat loss anticipated	Neutral	-	Neutral	-
	Degradation of habitats from dust generated by construction traffic.	Temporary not significant adverse	-	Temporary, not significant adverse	CEMP

Ecological Receptor / Ecological Importance	Summary of Effect	Level of Effect	Additional Mitigation	Residual Effect and Significance	Mechanism by which Secured
Trackway Adjacent to The Gorse pDWS, Kennel Copse pDWS County Level					
All Non-statutory Sites	Degradation of habitats from air pollution generated by construction traffic, specifically airborne NO_X, NH_3, Nitrogen deposition and Acid deposition	Temporary neutral to not significant adverse	-	Temporary, neutral to not significant adverse	-
	Degradation of habitats via hydrological pathways: surface water/groundwater	Temporary neutral to not significant adverse	-	Temporary, neutral to not significant adverse	Site drainage design
The Heath pDWS **County Level**	Minor loss of Lowland Deciduous Woodland	Permanent, not significant adverse	-	Permanent, not significant adverse	-
	Degradation of habitats from dust generated by construction traffic.	Temporary, not significant adverse	-	Temporary, not significant adverse	CEMP
Ardley and Heyford CTA **County Level**	Habitat loss/gain	Permanent, not significant adverse	Additional habitat creation and sensitive long-term management of extensive calcareous grassland and lowland meadow habitat	Permanent, neutral to not significant beneficial	HMMP
	Degradation of habitats from air pollution generated by construction traffic	Temporary neutral to not significant adverse	-	Temporary neutral not significant adverse	-
Tusmore and Shelswell Park CTA **County Level**	Habitat loss / gain	Neutral	-	Neutral	-
Calcareous Grassland **National Level**	Habitat loss / gain	Neutral	Extensive calcareous grassland creation and sensitive long-term management, translocation of	Permanent, **significant beneficial**	CEMP / HMMP

Ecological Receptor / Ecological Importance	Summary of Effect	Level of Effect	Additional Mitigation	Residual Effect and Significance	Mechanism by which Secured
			calcareous grassland and supporting soils from within SSSI working areas to suitable receptor sites on new sidings and within new areas of calcareous grassland creation. Supplementation of grassland seed mixes using locally sourced green hay from appropriate calcareous grassland sites where possible.		
Lowland Meadow **County Level**	Habitat loss / gain	Permanent, not significant beneficial	Extensive lowland meadow creation and sensitive long-term management	Permanent, **significant beneficial**	HMMP
Neutral Grassland **Local Level**	Habitat loss / gain	Permanent, not significant beneficial	-	Permanent, not significant beneficial	HMMP
Veteran Trees **National Level**	Loss of T93 and of trees qualifying as veterans under the Biodiversity Gain Requirements (Irreplaceable Habitat) Regulations 2024	**Permanent significant adverse**	Relocation of cut veteran material to create a deadwood reserve adjacent to off-site ancient woodland/ on-site retained established woodland in accordance with the veteran Tree Strategy (HMMP).	Permanent, not significant adverse	CEMP / HMMP
	Veteran trees T150 and T152 retained within extensive green infrastructure with no	Neutral	-	Neutral	Planting scheme / HMMP

Ecological Receptor / Ecological Importance	Summary of Effect	Level of Effect	Additional Mitigation	Residual Effect and Significance	Mechanism by which Secured
	neighbouring pathways or roads. Veteran tree T170 retained within off-site third-party land with no public access.				
Lowland Deciduous Woodland **County Level**	Habitat loss / gain	Permanent, not significant beneficial	-	Permanent, not significant beneficial	Planting scheme / HMMP
Other Semi-natural woodland **Local Level**	Habitat loss / gain	Permanent, not significant beneficial	-	Permanent, not significant beneficial	Planting scheme / HMMP
Hedgerows **County Level**	Habitat loss / gain	Permanent, not significant beneficial	Translocation of important hedgerow sections to areas of permanent GI and subsequent management. Gapping up of sparsely growing sections of retained hedgerows	Permanent, not significant beneficial	CEMP / HMMP
Ashgrove Brook and tributaries **Local Level**	Realignment of tributary ditches associated with Ashgrove Brook. Habitat loss / gain	Permanent, neutral to significant beneficial	-	Permanent, neutral to not significant beneficial	HMMP
Padbury Brook Tributary **Site/Local Level**	Realignment of tributary section. Habitat loss / gain	Permanent, neutral to not significant adverse	-	Permanent, neutral to not significant adverse	HMMP
Gagle Brook **County Level**	Culverted section Habitat loss / gain	Permanent, **significant adverse**	Use of an over-large box culvert design (6m wide, 3.8m tall) far exceeding the brook channel width to enable partial	Permanent, not significant adverse	Highways infrastructure design
	Fragmentation of woodland corridor: species with poor dispersal capabilities	Permanent, **significant adverse**		Permanent, not significant adverse	

Ecological Receptor / Ecological Importance	Summary of Effect	Level of Effect	Additional Mitigation	Residual Effect and Significance	Mechanism by which Secured
	Fragmentation of woodland corridor: species with good dispersal capabilities	Permanent, neutral to not significant adverse	reinstatement of channel morphology, and natural processes to continue such as sediment movement.	Permanent, neutral to not significant adverse	
	Indirect fragmentation effects	Permanent, neutral to not significant adverse		Permanent, neutral to not significant adverse	
All Retained Habitats – watercourses, pond, hedgerows, scrub, mature trees, neutral grassland and woodland. **Local - County**	No habitat loss anticipated. Potential impacts mitigated via embedded mitigation. Many retained habitats to be buffered by on-site GI.	Neutral to not significant beneficial	-	Permanent, neutral to not significant beneficial	CEMP / HMMP
Basil Thyme **County Level**	Habitat loss / gain .	Neutral	In the event the species has subsequently colonised the proposed development area the HMMP specifies appropriate translocation techniques to be employed, with plants /associated soils reestablished within calcareous grassland	Permanent, not significant to significant beneficial	HMMP / CEMP
	Degradation of habitats from dust generated by construction traffic	Temporary not significant adverse	-	Temporary not significant adverse	CEMP
	Indirect impacts: disturbance, physical damage, pollution etc.	Neutral	-	Neutral	CEMP
Meadow clary **County Level**	Habitat loss / gain	Neutral	In the event the species has subsequently colonised the proposed development area the HMMP specifies appropriate translocation techniques to be	Permanent, not significant to significant beneficial	NE licence / HMMP / CEMP

Ecological Receptor / Ecological Importance	Summary of Effect	Level of Effect	Additional Mitigation	Residual Effect and Significance	Mechanism by which Secured
			employed, with plants reestablished within calcareous grassland		
			Potential to increase the number of plants for translocation via collecting and growing on seed	Permanent, not significant to significant beneficial	NE licence / HMMP / CEMP
	Degradation of habitats from dust generated by construction traffic	Temporary not significant adverse	-	Temporary not significant adverse	CEMP
Badger **Local Level**	Sett loss / creation	Temporary, not significant adverse	-	Temporary, not significant adverse	NE Licence / CEMP
	Disturbance of setts	Temporary, not significant adverse	-	Temporary, not significant adverse	-
	Harm	Neutral	-	Neutral	NE licence / CEMP
	Reduction in foraging opportunities until GI establishes	Temporary, not significant adverse, then neutral to not significant beneficial	-	Temporary, not significant adverse, then neutral to not significant beneficial	Planting scheme / CEMP / HMMP
Bat Roosting **Local Level**	Disturbance and or loss of small non-breeding common pipistrelle roosts within buildings [redacted]. Replacement roosts provided in accordance with a Natural England licence. Loss of trees with potential to support roosting bats (no roosts confirmed by survey).	Temporary, not significant adverse	-	Temporary, not significant adverse	NE Licence

Ecological Receptor / Ecological Importance	Summary of Effect	Level of Effect	Additional Mitigation	Residual Effect and Significance	Mechanism by which Secured
Bat Foraging **Local Level**	Direct loss and fragmentation of foraging and commuting habitats. Embedded GI will retain and buffer wildlife corridors and create enhanced habitat corridors.	Temporary, not significant adverse, then not significant beneficial	-	Temporary, not significant adverse, then not significant beneficial	Planting scheme / HMMP
	Fragmentation of Gagle Brook corridor	Neutral (*Pipistrellus, Nyctalus* and *Eptesicus* species) Permanent, not significant adverse (other bat species)	Use of an over-large box culvert suitable to maintain bat flightlines under the Middleton Stoney Relief Road.	Neutral	Highways infrastructure design
	Lighting in accordance with Lighting Scheme	Temporary, not significant adverse (light adverse species) Neutral (*Pipistrellus*, *Nyctalus* and *Eptesicus* species)	-	Temporary, not significant adverse (light adverse species) Neutral (*Pipistrellus*, *Nyctalus* and *Eptesicus* species)	Lighting Strategy
GCN **County Level**	GCN removed from working areas to receptor sites in advance of works commencing and in accordance with a Natural England licence (embedded mitigation).	Neutral	-	Neutral	NE licence
	Fragmentation of Metapopulation 3 during construction of eastern rail connection.	Temporary, not significant adverse	-	Temporary, not significant adverse	NE licence / HMMP
	Habitat loss / gain	Temporary, not significant adverse, then **significant beneficial**	-	Temporary, not significant adverse, then **significant beneficial**	HMMP
Reptiles	Harm	Neutral	-	Neutral	CEMP

Ecological Receptor / Ecological Importance	Summary of Effect	Level of Effect	Additional Mitigation	Residual Effect and Significance	Mechanism by which Secured
Local Level	Habitat loss / gain	Temporary, not significant adverse, then not significant beneficial	-	Temporary, not significant adverse, then not significant beneficial	HMMP
Breeding birds – Farmland species assemblage **County Level** – skylark and yellowhammer **Local Level –** other species	Phased removal of nesting and foraging habitat and phased creation of new GI	Temporary **significant adverse** then not significant adverse	Extensive species-rich grassland creation including lowland meadow, and provision of seed-bearing cover crop and beetle banks.	Temporary neutral then not significant beneficial (skylark) Temporary not significant adverse then not significant beneficial (other farmland birds)	HMMP
Breeding birds – generalist species assemblage **Local Level**	Phased removal of nesting and foraging habitat and phased creation of new GI	Temporary not significant adverse then not significant beneficial	-	Temporary not significant adverse then not significant beneficial	CEMP / HMMP
Breeding birds	Disturbance / harm to nest sites	Temporary not significant adverse to neutral	Bird box installation, including installation of three barn owl boxes	Long-term neutral to not significant beneficial	CEMP
Wintering birds - Farmland species assemblage **County Level** - golden plover, skylark, corn bunting, yellowhammer, and reed bunting **Local Level** - grey partridge, stock dove, barn owl, starling, meadow pipit	Phased removal of foraging habitat and phased creation of new GI	**Significant adverse**	Extensive species-rich grassland creation including lowland meadow, and provision of seed-bearing cover crop and beetle banks.	Temporary not significant adverse then neutrall	CEMP / HMMP
Wintering birds - generalist species assemblage **Local Level**	Phased removal of foraging habitat and phased creation of new GI	Temporary not significant adverse then neutral	-	Temporary not significant adverse then neutral l	CEMP / HMMP

Ecological Receptor / Ecological Importance	Summary of Effect	Level of Effect	Additional Mitigation	Residual Effect and Significance	Mechanism by which Secured
Wintering birds **Local** to **County Level**	Disturbance	Temporary not significant adverse	-	Temporary, not significant adverse	CEMP
Invertebrates **Local Level**	Habitat loss including low magnitude loss of priority habitats such as calcareous grassland, neutral grassland and deadwood.	Temporary not significant adverse effect then neutral to not significant beneficial	Extensive species-rich grassland creation and sensitive long-term management. Inclusion of elm within tree planting to provide a food resource for white-letter hairstreak. Relocation of cut veteran material to create a deadwood reserve adjacent to off-site ancient woodland/ on-site retained established woodland. Retention of other deadwood as piles or standing deadwood.	Temporary not significant adverse effect then neutral to **significant beneficial**	Planting scheme / HMMP
Otter **County Level**	Habitat loss / fragmentation / creation	Permanent, not significant adverse	Use of an over-large box culvert suitable to maintain commuting opportunities under the Middleton Stoney Relief Road.	Permanent, not significant adverse	CEMP / HMMP
	Disturbance	Temporary, not significant adverse	-	Temporary, not significant adverse	CEMP
	Harm	Neutral	-	Neutral	CEMP
Hedgehog **Local Level**	Habitat loss / fragmentation / creation	Temporary, not significant adverse, then neutral	Extensive species-rich grassland creation and sensitive long-term management.	Temporary, not significant adverse, then neutral to not significant beneficial	HMMP

Ecological Receptor / Ecological Importance	Summary of Effect		Level of Effect	Additional Mitigation	Residual Effect and Significance	Mechanism by which Secured
Polecat **Local Level**	Habitat loss / fragmentation / creation		Temporary, not significant adverse (if present), then neutral	Extensive species-rich grassland creation and sensitive long-term management.	Temporary, not significant adverse (if present), then neutral to not significant beneficial	HMMP
Hazel Dormouse Considered absent (but has legislative protection)	Habitat loss / fragmentation / creation		Temporary, not significant adverse (if present), then not significant beneficial	-	Temporary, not significant adverse (if present), then Not significant beneficial	HMMP
	Harm		Neutral	-	Neutral	CEMP
Signal crayfish **Non-native/Invasive species**	Potential for works to spread crayfish or their eggs beyond the species' current range		Neutral	-	Neutral	CEMP
Operational						
Oxford Meadows SAC **International Level**	Degradation of habitats from air pollutants generated by operational traffic.		Neutral	-	Neutral	-
Ardley Cutting and Quarry SSSI **National Level**	Degradation of habitats from air pollutants generated by operational traffic.	NO_X	Neutral	Bespoke habitat creation and long-term sensitive management of extensive species-rich green infrastructure closely adjacent the SSSI for biodiversity, buffering and enhancing the resilience of associated habitats and their carrying capacity to support notable flora and fauna	Neutral	-
		NH_3	Permanent, not significant adverse		Neutral	Landscape Masterplan / HMMP
		Nitrogen				
		Acid				
	Hydrological impacts		Neutral	-	Neutral	-

Ecological Receptor / Ecological Importance	Summary of Effect		Level of Effect	Additional Mitigation	Residual Effect and Significance	Mechanism by which Secured
	Increased recreational use of Ardley Fields Quarry Nature Reserve and due to use of new bridleway resulting in trampling, nutrient enrichment.		Permanent, not significant adverse	Limiting access through the use of fencing and/or strategic planting, provision of appropriate signage, information boards and litter bins.	Permanent, not significant adverse	-
	Lighting impacts to foraging/committing and roosting bats		Permanent, neutral to not significant adverse	-	Permanent, neutral to not significant adverse	Lighting Strategy
Ardley Road Verge Nature Reserve, Ardley Field Quarry LWS **County Level** Neighbouring Local **Level Sites**	Increased recreational use causing trampling, nutrient enrichment and littering		Permanent, not significant adverse	Limiting access through the use of fencing and/or strategic planting, provision of appropriate signage, information boards and litter bins.	Permanent neutral to not significant adverse	Landscape Masterplan / HMMP
Unnamed Trixax Park Oxford AW	Degradation of habitats from air pollutants generated by operational traffic	NO_X	Permanent, not significant adverse	-	Permanent, not significant adverse	-
Ardley Fields Quarry LWS, Unnamed Trixax Park Oxford AW, and across parts of Ham Home-cum-Hamgreen Woods SSSI, Shabbington Woods Complex SSSI, Trow Pool LWS		NH_3	Permanent, not significant adverse	-	Permanent, not significant adverse	-
Burntwood Copse AW		Nitrogen	Not significant adverse	-	Not significant adverse	-
Shabbington Woods Complex SSSI Burntclose Copse AW, Ardley Fields Quarry LWS, Trow Pool LWS,		Acid	Not significant adverse	-	Not significant adverse	-

Ecological Receptor / Ecological Importance	Summary of Effect	Level of Effect	Additional Mitigation	Residual Effect and Significance	Mechanism by which Secured
Unnamed Trixax Park Oxford AW					
Trackway Adjacent to The Gorse pDWS **Local Level**	Increased recreational use causing trampling, nutrient enrichment.	Neutral	-	Neutral	-
Sites included within the AQA but not listed above	Degradation of habitats from air pollutants generated by operational traffic	Neutral	-	Neutral	-
Other ecological sites and habitats sensitive to air quality	Degradation of habitats from air pollutants generated by increased diesel train journeys	Neutral	-	Neutral	-
Retained veteran trees **National Level**	T150 and T152 and retained BNG veteran trees will be buffered by on-site green infrastructure and placed into sympathetic long-term management.	Neutral	-	Neutral	HMMP
Retained and newly created habitats **Local – County Level**	Retained and newly created grassland, hedgerows and woodland will be placed into sympathetic long-term management.	Long-term not significant beneficial	-	Long-term not significant beneficial	HMMP
	Visitor pressure effects e.g. littering, nutrient enrichment from dog faeces, erosion from informal paths / heavy footfall.	Permanent, not significant adverse	Limiting access through the use of fencing and/or strategic planting, provision of appropriate signage, information boards and litter bins.	Permanent neutral to not significant adverse	HMMP
Basil Thyme **County Level**	Long-term management	Permanent, neutral to not significant beneficial	-	Permanent, neutral to not significant beneficial	HMMP
Meadow clary **County Level**	Long-term monitoring and management	Permanent, neutral to not significant beneficial	-	Permanent, neutral to not significant beneficial	HMMP

Ecological Receptor / Ecological Importance	Summary of Effect	Level of Effect	Additional Mitigation	Residual Effect and Significance	Mechanism by which Secured
Badger **Local Level**	Increased levels of badger mortality in association with road traffic collision.	Permanent, not significant adverse	-	Permanent, not significant adverse	NE licence / highways infrastructure design
	Management of GI for biodiversity	Long-term not significant beneficial	-	Long-term not significant beneficial	HMMP
Overall Bat Assemblage **Local Level**	Increase in mortality rates due to severance of flight lines by new roads: Gagle Brook	**Permanent, significant adverse**	Design and long-term maintenance of green infrastructure to encourage bats to fly under the road.	Permanent, neutral to not significant adverse	HMMP
	Wider Site	Permanent, neutral to not significant adverse	-	Permanent, neutral to not significant adverse	-
	Lighting impacts to foraging/committing and roosting bats across the operational site.	Permanent, neutral to not significant adverse	-	Permanent, neutral to not significant adverse	Lighting Strategy
	Management of GI for biodiversity	Long-term not significant beneficial	-	Long-term not significant beneficial	HMMP
GCN **County Level**	Barriers to dispersal	Permanent, neutral to not significant adverse	-	Permanent, neutral to not significant adverse	NE licence
	Management of GI for biodiversity	Long-term **significant beneficial**	-	Long-term **significant beneficial**	HMMP
Reptiles **Local Level**	Barriers to dispersal	Permanent, neutral to not significant adverse	-	Permanent, neutral to not significant adverse	NE licence
	Management of GI for biodiversity	Long-term not significant beneficial	-	Long-term not significant beneficial	HMMP
Birds **Local to County Level**	General disturbance effects to sensitive species from the operation of the site	Permanent, not significant adverse	Bird box provision to offer increased nesting opportunities to offset effects.	Neutral	HMMP

Ecological Receptor / Ecological Importance	Summary of Effect	Level of Effect	Additional Mitigation	Residual Effect and Significance	Mechanism by which Secured
	Disturbance and direct harm to farmland birds due to recreational activity within/adjacent to GI	Permanent, **significant adverse**	Maintenance of post and rail fencing between PRoWs and open grassland habitats to protect from disturbance Provision of viewing screens and information boards to promote public engagement with mitigation habitats.	Permanent, not significant adverse	HMMP
	Noise disturbance close to affected roads Breeding birds and wintering birds	Permanent, not significant adverse to **significant adverse**	Sensitive long-term management of mitigation grassland areas for farmland and ground-nesting birds.	Permanent, not significant adverse	HMMP
	Management of GI for biodiversity	Long-term not significant beneficial	Sensitive long-term management of mitigation grassland for farmland and ground-nesting birds and monitoring of bird populations with adaptive feedback to the HMMP. The seed-bearing crop will be re-established annually, with appropriate crop rotations and sympathetic management.	Long-term neutral to not significant beneficial	HMMP
Invertebrates **Local Level**	Management of GI for biodiversity	Long-term beneficial	-	Long-term beneficial	HMMP
	Impacts to habitats as a result of localised pollution / run-off	Neutral	-	Neutral	Site drainage design
Otter **County Level**	Barriers to dispersal	Permanent, not significant adverse	-	Permanent, not significant adverse	-

Ecological Receptor / Ecological Importance	Summary of Effect	Level of Effect	Additional Mitigation	Residual Effect and Significance	Mechanism by which Secured
	Increased levels of mortality in association with road traffic collision.	Permanent, not significant adverse			
	Management of GI for biodiversity	Long-term not significant beneficial	-	Long-term not significant beneficial	HMMP
Hedgehog **Local Level**	Barriers to dispersal	Neutral	-	Neutral	-
	Management of GI for biodiversity	Long-term not significant beneficial	-	Long-term not significant beneficial	HMMP
Polecat **Local Level**	Barriers to dispersal	Neutral	-	Neutral	-
	Management of GI for biodiversity	Long-term not significant beneficial	-	Long-term not significant beneficial	HMMP
Likely significant effect identified in **bold text**.					

6.7 CUMULATIVE EFFECTS

6.7.1. This section assesses the likely significant effects of the Proposed Development when considered in combination with other planned or future projects.

6.7.2. An assessment of likely cumulative effects requires an understanding of the capacity of the receiving environment and whether critical thresholds would likely be exceeded by the combination of projects. The emphasis is on likely shared receptors or populations and species likely to experience effects from the Proposed Development and one or more other committed development project. Time implications, geographical proximity and habitat connectivity are all of relevance to this assessment.

6.7.3. The list of relevant projects is set out in Chapter 1 of this ES (Table 1.3) and reflects the assessment scope agreed through ES Scoping and in dialogue with the Local Planning Authority. From this list the following projects have potential to result in cumulative effects on ecological receptors as a consequence of their proximity and/or similarity of habitat coverage and loss and hence are considered within the assessment of potential cumulative effects.

Heyford Park, Camp Road Upper Heyford

6.7.4. The consented residential and mixed-use development is located adjacent to the western boundary of the Main Site of the Proposed Development and is being brought forward in a phased manner, with each phase providing a soft landscaping scheme designed to mitigate for the habitat losses associated with that phase.

6.7.5. Based on the Ecological Assessment which formed part of the approved planning application, residual adverse ecological effects anticipated as a result of the consented Heyford Park development are the short-term loss of hedgerow, permanent loss of calcareous grassland and nesting bird habitats, and potential disturbance to badgers during construction (all not significant adverse effects). Once the Heyford Park site is operational a permanent (not significant) adverse effect is anticipated on grassland habitats and on associated invertebrate and bird assemblages including ground nesting birds as a result of recreation impacts.

6.7.6. Construction of the OxSRFI Proposed Development will deliver a beneficial effect for hedgerow and calcareous grassland habitats. As such no in-combination construction effect with regard to habitat IEFs is identified.

6.7.7. The Heyford Park proposals could require closure of badger setts along Chilgrove Drive at the western edge of the OxSRFI site. Any sett closures would be completed under the terms of a Natural England licence that will detail appropriate measures required to mitigate adverse effects to local badger clans. [redacted] S2 is required to be closed therefore there is potential for an in-combination effect on the clan based out of this sett, should the two developments undertake sett closures [redacted] in the same year. With the implementation of the embedded mitigation secured via the licencing process, including the provision of artificial setts in advance of the closure of S2, any in-combination effect on badgers will be temporary, local level and **not significant adverse**.

6.7.8. The OxSRFI development will result in a not significant adverse construction effect on nesting birds that will be reversed as the successive phases of the green infrastructure establish, resulting in a long-term beneficial effect. Given the continued availability of suitable nesting habitats for the duration of the OxSRFI Proposed Development the temporary in-combination effect between the two developments is unlikely to result in a significant in combination effect on local nesting bird assemblages.

6.7.9. In addition to the approved (committed) development at Heyford Park, a live planning application for a 'New Town' of 9000 dwellings is being consulted upon ahead of determination. This additional potential future development is considered below.

Bicester Urban Extension

6.7.10. This allocated urban extension is located c.2.5km from the OxSRFI Main Site and c.1.5km from the proposed Highways Works.

6.7.11. The Ecological Assessment which formed part of the submitted ES chapter (Planning Ref: 21/04275/OUT) concluded there would be a residual not significant adverse effect on nesting farmland birds (specifically skylark, grey partridge, yellow wagtail, yellowhammer, linnet, kestrel and meadow pipit) due

to habitat loss and direct harm during construction. As such, should the timing of the two developments coincide there is potential for a local level cumulative effect on farmland bird species. The delivery timetable for the Urban Extension is considerably longer than that for the OxSRFI Proposed Development however, therefore any effects (and new planting) will be phased, helping reduce the scale and magnitude of effects.

6.7.12. Given the physical separation of the two sites and the tendency of such bird species to utilise habitats within a landscape in a flexible manner, selecting nest sites on the basis of crop type within a rotation cycle for example, any cumulative effect would be temporary and not significant.

‘Great Wolf’ Leisure Resort

6.7.13. This consented redevelopment of part of a golf course into a leisure resort is located c.1.2km south of the Middle Stoney Relief Road (Planning Ref: 19/02550/F varied through: 21/04158/F). No residual adverse effects are anticipated on faunal IEFs, and whilst the consented development will result in the loss of hedgerows, trees, species-poor grassland and pond habitat, the BNG assessment indicates a predicted net gain in habitat and hedgerow biodiversity units. These proposals are therefore unlikely to result in any significant in-combination ecological effect with the OxSRFI Proposed Development.

Land north of Camp Road and east of Larsen Road, Heyford Park.

6.7.14. The consented Camp Road/Larsen Road residential development (Planning Ref: 22/03063/F) is located c.250m to the west of Chilgrove Drive and is under construction. An overall loss of habitat biodiversity units is anticipated across the site, necessitating a strategy to be implemented, as has been agreed with Cherwell District Council, to deliver grassland habitat off-site.

6.7.15. Given the residential development will result in a permanent residual (not significant) adverse effect on grassland habitats there is potential for a temporary in-combination effect until such time as the OxSRFI achieves a net gain in grassland habitat. It is anticipated however that the creation of species-rich lowland meadow in the far north-west of the OxSRFI site will be undertaken as part of the initial phase of works, reducing the significance of the cumulative effect to neutral to not significant adverse.

6.7.16. The residential development will mitigate associated impacts to GCN by putting a retained habitat corridor into sensitive long-term management, as

detailed within the Landscape Management Plan submitted as part of the planning application, and by joining the Nature Space GCN District Level Licence to deliver off-site habitat enhancement. This development will however result in a site level permanent reduction in suitable terrestrial habitats for GCN Metapopulation 1 (a shared receptor with OxSRFI). A temporary in-combination effect on this metapopulation is therefore anticipated following the removal of suitable terrestrial habitats from neighbouring areas of the OxSRFI site feasibly accessible to GCN Metapopulation 1 (largely confined to the westernmost hedgerows the Main Site) until such time as the replacement GI is established. Given the limited extent of habitat removal from each site and the provision of embedded mitigation as outlined above, the in-combination effect will not approach a critical threshold that would result in a significant adverse effect to GCN Metapopulation 1 or to the species more widely.

Land adjacent to M40 Junction 9, north of the A41 and west of Little Chesterton, including South of Chesterton, and Lodge Farm .

6.7.17. This includes the consented site to the northeast of M40 Junction 9 (Siemens) located c.7km south of the Main Site and c.2.4km south of the proposed highways improvement works along the B4030 (Planning Ref:22/01114/F).

6.7.18. Residual ecological effects of this committed development are anticipated in terms of habitat loss, construction effects to bats and birds, and operational impacts to bats and other nocturnal species. Given the considerable intervening distance however the M40 J9 works are considered to lie outside the zone of influence of the OxSRFI Proposed Development for these IEFs (and vice versa). Any residual effects will therefore impact geographically separated assemblages/populations with no opportunity for in-combination effects to take place.

6.7.19. The draft allocation sites referred to as part of a potential wider employment allocation in the Cherwell draft Regulation 19 Local Plan (Policy BIC E2 (South of Chesterton), and Policy BIC E3 (Lodge Farm)) are located c.4km from the OxSRFI Main Site and c.1.3km from the proposed J9 highways works.

6.7.20. The South of Chesterton/Lodge Farm sites are primarily comprised of agricultural land with no on-site priority habitats identified, though with an area of priority habitat 'deciduous woodland' along the southern boundary of the former parcel site and some older trees to the north of Lodge Farm. A section of Gagle brook flows southeast through the Lodge Farm parcel.

6.7.21. Whilst there are no confirmed proposals yet available for the draft allocation site, an application is with Cherwell District Council awaiting determination. The specific requirements detailed within the draft allocation include the preservation and enhancement of habitats and species on site, particularly protected species and habitats and creation and management of new habitats to achieve an overall net gain in biodiversity including the creation of a local nature reserve and the creation/enhancement of linkages with existing priority habitats. Therefore, whilst it is likely that its development for employment use will necessitate the partial removal of the existing hedgerow and tree resource, and potentially also of riverine habitats along the brook, the policy requirements coupled with the mandatory requirement to deliver 10%+ biodiversity net gain would mitigate such effects. Nevertheless, a residual significant adverse effect on these habitats is possible, dependant on the final approved scheme in due course.

6.7.22. Development of one or both of these allocated sites is likely to result in effects on faunal groups that are associated with open agricultural land and known to be present within the local area, notably breeding and over-wintering farmland birds, therefore dependant on the final scheme there is potential for an adverse cumulative effect on farmland birds. Given the intervening distance to the main areas of the OxSRFI Proposed Development such impacts would largely act on geographically separated assemblages/populations and as such any resulting cumulative effect would not be significant.

North of Camp Road and west of Chilgrove Drive.

6.7.23. The consented residential development west of Chilgrove Drive is located between the Camp Road/Larsen Road site and the western boundary of the OxSRFI Main Site (Planning Ref: 21/04289/OUT).

6.7.24. This development will deliver an overall net biodiversity gain of +10%, therefore no significant effects are anticipated in combination with the Proposed Development in terms of habitat loss. Residual operational not significant adverse impacts are however predicted to local bat populations due to an increase in ambient light levels remaining following the implementation of a site-wide lighting strategy, and to GCN Metapopulation 1 due to increased levels of predation by cats. A similar residual impact on the resident GCN population was not identified for the Camp Road/Larsen Road residential development but given the assumed increase in local cat numbers that would also result from this scheme a long-term combined predation effect is presumed once both residential sites are operational.

6.7.25. The OxSRFI Proposed Development will not contribute to the local cat population size, however may exacerbate the predation effect due to a low magnitude reduction of suitable terrestrial habitat in the close vicinity of GCN Metapopulation 1, resulting in a temporary in-combination effect until new habitat corridors and other GI become established within the west of the Main Site. Existing terrestrial habitats surrounding ponds present within the Camp Road/Chilgrove Drive site will be retained and continue to provide access to high quality refuge for GCN in close proximity to the ponds. Terrestrial habitats within the OxSRFI site are more distant and of lesser value to the species, hence any short-term cumulative adverse impact would not represent a significant effect on the local GCN population.

6.7.26. Once operational the residential development has potential to adversely impact Weston Fen SSSI via discharges into Gallos Brook upstream of the SSSI. The OxSRFI Application Site does not discharge into the Gallos Brook or any other watercourse that ultimately reaches Weston Fen, therefore there is no potential for an in-combination effect on this receptor.

Additional potential future developments

6.7.27. In addition to the above 'committed' development schemes and projects, consideration has been given to the following emerging, potential future (but as yet not 'committed') development proposals.

Distribution/Logistics development proposals north of Junction 10 M40 (Albion Land, and Tritax)

6.7.28. These proposed, but not approved or allocated sites, comprise two parcels of land to the east and west of the A43 east of Junction 10 of the M40 (Planning Refs: 21/03266/F (infrastructure only), 21/03268/OUT and 21/03267/OUT). All applications for both schemes have been refused consent by the LPA and at the time of writing remain subject to planning appeal proceedings at the time of writing. These partially lie within the Order Limits of the Proposed Development in the vicinity of Baynards Green Roundabout.

6.7.29. The Environment Statements prepared for these applications identified no significant residual effects on any habitat ecological receptors. A temporary not significant residual adverse effect on the local bat assemblage is however anticipated within both the eastern and western sites until associated hedgerow planting establishes, and a residual permanent significant adverse effect is expected on local bird assemblages associated with arable and hedgerow habitats.

6.7.30. In combination with OxSRFI there is likely to be a short term **not significant adverse** cumulative effect of loss of foraging habitat for bats. However, with time, the mitigation hedgerow planting proposed as part of the Proposed Development will mature to replace hedgerows lost. Through appropriate design and implementation of proposed mitigation, it is expected that any cumulative adverse effect will therefore be minimised to a **neutral** effect.

6.7.31. In combination with the OxSRFI Proposed Development the J10 M40 proposals may therefore result in a **permanent significant** cumulative effect on farmland bird species associated with open arable and grassland habitats, and dependant on the timing of habitat removal works within each site, a potential **temporary significant** cumulative effect on hedgerow bird assemblages.

6.7.32. The J10 M40 sites are considered to be separated from the J10 balancing ponds and associated GCN population by the M40 and A43 therefore no in-combination effect on this species is anticipated. Embedded mitigation including provision of buffer planting and adherence to precautionary working methods as specified within a site CEMP will furthermore ensure no residual impacts effect the badger clan resident to the east of the eastern application site. As such no additional potential in-combination effects are identified.

Heyford Park 'new town' proposals

6.7.33. A hybrid planning application was lodged for the Heyford Park site in August 2025 for residential development of up to 9,000 dwellings and mixed-use development including employment, commercial, business, hotels, schools and service buildings (Planning Ref: 25/02190/HYBRID). The Heyford Park development was short-listed as a potential New Town by the UK Government Task Force in September 2025[92].

6.7.34. The mechanism by which the New Town development would provide a 10%+ net biodiversity gain is yet to be confirmed but would likely comprise a mix of habitat creation and enhancement on Site and off-site compensation through a habitat bank.

6.7.35. Residual adverse effects to IEFs identified in the accompanying ES chapter were associated with a permanent reduction in the extent of the Upper Heyford

[92] https://www.gov.uk/government/publications/new-towns-taskforce-report-to-government/initial-government-response-september-2025

Airfield LWS and a reduction also in the extent of the Ardley and Heyford CTA (County level effects), and of the extent of grassland remaining within the CTA.

6.7.36. Construction of the OxSRFI Proposed Development will not result in any direct loss of habitat from the Upper Heyford Airfield LWS but will provide beneficial soft landscape buffering around part of the LWS perimeter. The loss of ecologically valuable habitats from within the CTA will be mitigated via extensive grassland and other habitat creation and enhancement elsewhere within the CTA and extending into adjacent habitats that will provide an overall beneficial effect for these IEFs. As such no likely significant in-combination effects between the two developments are identified.

Puy du Fou leisure proposals, North of Bucknell

6.7.37. An outline application is currently under consideration for a tourism development encompassing theatres, hotels, a conference centre and other ancillary facilities (Planning Ref: 25/02232/OUT). If approved the tourism facilities would only be open to the public between April and October inclusive each year, but with the conference centre and hotels operating year-round.

6.7.38. This scheme is not allocated for development within the Adopted Local Plan or proposed to be allocated in draft Local Plan (Reg 19).

6.7.39. The Environment Statement prepared for this application does not identify any significant residual adverse effects on any habitat ecological receptors, therefore no potential for likely in-combination effects between the Puy du Foy development and the OxSRFI Proposed Development are identified.

6.8 SUMMARY AND CONCLUSIONS

6.8.1. This Ecology and Arboriculture chapter makes an assessment of the potential effects of the Proposed Development upon wildlife habitat and fauna. The assessment has been undertaken in line with best practice guidance from the Chartered Institute of Ecology & Environmental Management and takes account of the legal protection and planning policy that is relevant to habitats and species. Significant effects from the Proposed Development are identified and measures put in place to avoid or reduce these effects and to provide enhancements.

6.8.2. There are a number of legally protected areas that are important for wildlife and that coincide with the Application Site or are present within the wider landscape. There are also other habitats present within and neighbouring the

Application Site that are recognised as being important in Oxfordshire, including hedgerows, woodland, trees, watercourses and calcareous grassland.

6.8.3. The habitats of the Application Site are dominated by arable farmland and pasture that are largely of low importance for nature conservation. The more important habitats of the Application Site are the hedgerows, watercourses, woodland and trees. There are no veteran trees present within the Application Site. Some hedgerows have a high diversity of shrub species and good structure, which increases their importance. The watercourses in and around the Application Site provide habitat structure and a route for wildlife to move across the local landscape.

6.8.4. A suite of wildlife surveys has been undertaken that targeted important and notable species. This has confirmed that several such species and groups make use of the habitats, including badgers, a typical assemblage of bats and GCN. Farmland birds and birds typical of the habitats present utilise the Application Site and surrounding landscape during the winter and nesting seasons. Surveys have concluded that the Application Site supports a range of common native reptile species, and that suitable habitats within and adjacent to the Ardley Quarry and Cutting SSSI support a good number of butterfly species including small numbers of notable species.

6.8.5. Anticipated residual issues and effects relevant to important ecological receptors are identified in Table 6.16. Overall, the Proposed Development will address the majority of the potential impacts upon designated sites, habitats and fauna through good design and other embedded mitigation. Notably, with implementation of the proposed mitigation, all unavoidable residual adverse effects will be reduced to below significant levels.

6.8.6. Some residual adverse impacts to local designated sites including the Ardley Cutting and Quarry SSSI are anticipated as a result of increased traffic journeys within the immediate area and across the impacted road network leading to localised and generally low magnitude impacts to airborne pollution deposition rates, though such impacts are not considered significant in EIA terms. These effects should furthermore be viewed within the context of the operational SRFI replacing a significant quantity of road-based freight with rail-based freight and therefore directly benefiting road congestion and associated transport related air pollution across the wider network.

6.8.7. As is typical for a development of this kind, it is anticipated that there would be some permanent loss of habitats utilised by priority fauna such as arable

and open grassland that support farmland bird assemblages, resulting in some temporary adverse effects as a result of this change. The Proposed Development will however provide permanent and wide-ranging residual benefits for most resident bird assemblages and also for other notable species confirmed present locally or are potentially present within the local area. Likely significant benefits are identified for calcareous grassland (IEF of National importance), GCN and invertebrates, including several of the priority butterfly species listed within the Ardley Cutting and Quarry SSSI citation.

6.8.8. Through retention of existing habitats and features where possible as part of the embedded design, effects are minimised as far as possible. Also, with integrated habitat enhancement and creation as part of the significant Green Infrastructure the Proposed Development will deliver BNG in excess of 10%, despite not being mandatory to do so. Overall, the design will maintain and improve upon the conservation status of notable habitats, and will maintain, and where possible provide local level enhancement for priority faunal species and assemblages in accordance with the requirements of national and local planning policy.