ENVIRONMENTAL IMPACT ASSESSMENT: SCOPING REPORT

LAND WEST OF BRACKLEY, SOUTH NORTHAMPTONSHIRE

ON BEHALF OF ASHFIELD LAND DEVELOPMENTS LTD & VULPES LAND

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DESIGN ENVIRONMENT PLANNING ECONOMICS HERITAGE

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1. Introduction

1.1 Overview

1.1.1 This Environmental Impact Assessment (EIA) Scoping Report has been prepared on behalf of Ashfield Land Developments Ltd (Ashfield Land) & Vulpes Land (the "Applicant") in respect of Land West of Brackley (the "Application Site" or "Site") which is proposed for new residential development (the "Proposed Development").

1.1.2 For the purposes of this Scoping Report, the Application Site extends to approximately 34.2 ha comprising six fields currently in agricultural use. The Site has the capacity to accommodate approximately 700 homes, including a mix of dwelling sizes, as well as a mix of market and affordable housing. The proposals will also include infrastructure, public open space and landscape areas.

1.1.3 The Application Site is situated within the administrative area of South Northamptonshire Council (SNC) and lies on the north west edge of Brackley approximately 1 mile north west of the town centre. The location and extent of the Scoping Site is shown on the Site Location Plan provided at **Appendix A**.

1.1.4 This Scoping Report has been prepared to accompany a formal EIA Scoping Request to SNC under Regulation 15 of the Town and Country Planning (Environmental Impact Assessment) Regulations 2017 (as amended 2018). The Applicant has appointed a team of specialist consultants to consider planning and environmental matters in relation to the Proposed Development and to provide input into the production of this Scoping Report, as listed below.

Table 1.1 Consultant Team

Topic	Consultant
Socio Economic and Human Health	Turley
Landscape and Visual	RSK
Ecology	Biome
Lighting	Designs for Lighting
Archaeology & Heritage	EDP
Transport and Access	Pegasus Group
Noise and Vibration	Resound Acoustics
Air Quality	Air Quality Consultants
Ground Conditions	Pam Brown Associates
Flood Risk and Drainage	BWB
Utilities	BWB
Sustainability/Climate change	Turley

1.1.5 The Scoping Report has been produced on behalf of Ashfield Land Developments Ltd (Ashfield Land) & Vulpes Land by Pegasus Group. Pegasus is registered to the EIA Quality Mark, a scheme operated by the Institute of Environmental Management and Assessment (IEMA) which allows consultancies that lead the co-ordination of statutory EIAs in the UK to make a commitment to excellence in their EIA activities and have this commitment independently reviewed.

1.2 Requirements of the Environmental Impact Assessment Process

1.2.1 The EIA process is the mechanism by which development proposals are appraised in terms of environmental and socio-economic criteria, in addition to the engineering and technical considerations. The EIA process defines the context of the Proposed Development and its construction, and examines the issues considered pertinent.

1.2.2 The purpose of the EIA is to establish the nature of the existing Application Site and its surroundings (i.e. the baseline) and the nature of the Proposed Development and compare the baseline with the scenario once the proposals are in place, so to identify the likely significant effects that may arise as a result. This requires consideration of effects during construction, including any demolition or enabling works, and effects once operational. The document produced as a result of the EIA process is known as the Environmental Statement (ES).

1.2.3 The EIA Regulations require that any Proposed Development falling within the description of a 'Schedule 2 Development' within the meaning of the Regulations, may be subject to an EIA where such development is *likely to have 'significant' effects on the environment by virtue of factors such as its nature, size or location* (Regulation 2b).

1.2.4 The Development falls under the category of "Infrastructure Projects" (Schedule 2, 10b) where it is identified that the applicable threshold above which EIA may be required is:

> *i) The development includes more than 1 ha of urban development which is not dwellinghouse development; or*
>
> *ii) The development includes more than 150 dwellings; or*
>
> *iii) The overall area of the development exceeds 5 hectares.*

1.2.5 Further indicative criteria and thresholds to assist whether EIA is likely to be required are set out within the National Planning Policy Guidance (EIA section). With respect to category 10b developments, the further indicative criteria for "*Sites which have not previously been intensively developed are:*

> *(i) area of the scheme is more than 5 hectares; or*
>
> *(ii) it would provide a total of more than 10,000 m^2 of new commercial floorspace; or*
>
> *(iii) the development would have significant urbanising effects in a previously non-urbanised area (e.g. a new development of more than 1,000 dwellings)."*

1.2.6 Having regard to the Application Site and the nature of the Proposed Development, in the context of the above it is considered the proposals could potentially lead to likely significant effects on the environment. The applicant therefore intends to submit an ES in support of a future planning application, the content or 'scope' of which is set out and discussed throughout this document.

1.3 Purpose of the Scoping Report

1.3.1 This Scoping Report has been prepared to accompany a formal EIA Scoping Request under Regulation 15 of the Town and Country Planning (Environmental Impact Assessment) Regulations 2017 (as amended 2018). The purpose of the Scoping Report is to seek a formal view from SNC (and other consultees where relevant) on the information to be contained within the Environmental Statement (ES) which will accompany a forthcoming planning application on the above Application Site

1.3.2 In accordance with Regulation 15, paragraph 2, this Scoping Report contains:

- "A plan sufficient to identify the land;
- A brief description of the nature and purpose of the development on the environment;
- An explanation of the likely significant effects of the development on the environment; and
- Such other information or representations as the person making the request may wish to provide or make."

1.3.3 Specifically, this Scoping Report seeks to identify those potential likely significant environmental effects which could occur as a result of the Proposed Development and are subsequently proposed to be assessed in the EIA process, and reported within the resultant ES. Discussion and reasoned justification is also provided within this report on topics which are proposed to be 'scoped out' of the EIA process.

1.3.4 This Scoping Report is submitted to SNC as part of the formal request for a Scoping Opinion and we welcome comment on the proposed scope and contents of the ES from SNC and other consultees that they wish to nominate, in accordance with Regulation 15. It is anticipated such consultees may include the following:

- South Northamptonshire Council (various departments including environmental health, landscape and ecology where applicable)
- Northamptonshire County Council;
- Other nearby Local Authorities;
- Other Consultees:
    - Environment Agency
    - Highways England
    - Natural England
    - Anglian Water
    - Historic England
- Relevant Parish Councils

1.3.5 It is requested that the Applicant is informed of those consultees who are notified of this Scoping Request.

1.4 Structure of the Scoping Report

1.4.1 The remainder of this EIA Scoping Report is divided into the following Sections:

- Section 2: The Application Site and Project Overview
  - An overview of the Application Site and the Proposed Development.
- Section 3: Legislative Requirements and the EIA Process
  - A summary of the relevant EIA legislation and EIA process which will be undertaken.
- Section 4: Proposed Scope of the Environmental Statement (ES)
  - Individual discussions on each topic to be assessed within the ES, including information regarding specific methodology.
- Section 5: Topics proposed to be Scoped Out of the ES
  - Each environmental topic not proposed to be considered in the ES is discussed in turn.
- Section 6: Structure of the ES
  - The structure and format of the ES document is outlined.
- Section 7: Environmental Statement Scoping Summary

2. The Application Site and Project Overview

2.1 The Application Site and Surroundings

2.1.1 The Application Site is situated within the administrative area of South Northamptonshire Council (SNC) and lies on the north west edge of Brackley. Brackley itself is approximately 18km (11 miles) east of Banbury, 18km (11 miles) south west of Towcester, 11km (7 miles) west of Buckingham and 18km (11 miles) north of Bicester. The M40 lies approximately 12km (8 miles) to the west of Brackley, providing access north towards Birmingham and south towards London. The closest train stations are in Banbury and King's Sutton, with services to London, Reading and other regional settlements.

2.1.2 The Application Site itself is situated on the north western edge of Brackley and extends to approximately 34.2 ha. To the east of the Site lies existing residential development, the A442 lies to the south of the Site, and to the north and west lie agricultural fields. The Site consists of six irregular shaped fields, separated by a series of hedgerows. The majority of the boundaries of the Site are comprised of mature trees.

2.1.3 The south western boundary of the Site is formed of tall trees on a raised bank, which was formerly a railway line, which lies between the Site and the A442. The majority of the south eastern boundary is formed by mature trees which separate the Site from an area of public open space which runs behind the gardens of the existing residential properties to the south east. Brackley Rugby Club lies adjacent to the northern part of the eastern boundary. There is also an access road to Brackley Grange from Halse Road in this location. The north eastern boundary of the Site is formed of a low hedgerow adjacent to Halse Road. The majority of the north western boundary is formed of mature trees and hedgerows running along the field boundaries. The northern part of the north western boundary is currently undefined, running through an agricultural field.

2.1.4 There is an existing public footpath crossing the Application Site, running alongside one of the east-west orientated hedgerows that cross the Site. The footpath links the residential area of Brackley with the wider countryside.

2.2 Project Overview

2.2.1 Whilst the proposals are developing as technical work continues, it is likely the planning application will seek outline permission, with access not reserved, for up to 700 dwellings, local centre/community facilities (potential for a primary school), areas of public open space, landscaping, sustainable drainage measures and associated infrastructure.

2.2.2 The scheme is envisaged to be served by two primary vehicular access points; to the north onto Halse Road and onto the A422 in the south. Whilst the exact location and form of the junctions are subject to ongoing technical work and confirmation with Northamptonshire County Council, it is anticipated at this stage that a new roundabout access arrangement could be provided on Halse Road to provide access

to the north of the site, with a modified version of the existing Banbury Road roundabout to provide access from the south.

2.2.3 It is envisaged these access points will be linked by a primary access avenue running north to south through the site, forming an 'urban spine' from which development parcels will be accessed. This main spine road would be designed to accommodate a bus route. This will provide flexibility for operators in the future who serve the proposed and existing residential areas, and so will help to connect new occupiers with the town centre and also other settlements. The proposed internal highway layout would be designed to reflect modern guidelines as appropriate, in order to make it safe and efficient and to provide permeability for future residents by all modes of transport.

2.2.4 The proposals seek to retain and upgrade the existing Public Rights of Way crossing the site and will be enhanced with new footpaths/cycle links to provide additional connectivity with the existing community. In tandem with this, the vision for the green infrastructure strategy for the site aims to create a 'green spine' along the western boundary, from which branch a series of green corridors which cross the site. These corridors will enhance the existing hedgerows on the site and will link to the existing open spaces within the adjacent residential area, providing key pedestrian/cycle movement routes which link to existing routes within Brackley. The public open spaces will include formal and informal recreation areas, surface water attenuation and structural landscaping.

2.2.5 The majority of the development will comprise mainly two storey dwellings, with 2.5 and 3 storey buildings (max height 12m above finished ground levels), to create focal points and variety within the street scene. A mix of dwelling sizes will be provided on the site, as well as a mix of market and affordable housing.

2.2.6 The EIA will be based upon a set of defined parameters, which will identify the extent of different land use areas (e.g. residential, open space, roads etc), maximum heights of buildings and key landscape mitigation proposals integral to the scheme. This ensures that key elements are assessed accordingly.

2.2.7 Should planning permission be achieved for the Proposed Development, it is reasonable to assume, for assessment purposes, that construction could commence 2022/23 and last for approximately 7 years. This would result in completion c. 2030.

2.2.8 A Development Framework plan is enclosed at **Appendix B** which illustrates the initial land use layout and potential parameters. This will be developed further as technical work continues.

3. Legislative Requirements and the EIA Process

3.1 Legislative Requirements

3.1.1 The EIA process will be undertaken in accordance with the requirements of the Town and Country Planning (Environmental Impact Assessment) (Amendment) Regulations 2018, which are referred to in this document as the 'EIA Regulations'. Specifically, Schedule 4 (Regulation 18 (3)), sets out the information for inclusion in ESs, as replicated within **Appendix C** and summarised as follows:

Part 1:

- **'A description of the development'** - including information on the location of the development, the physical characteristics of the development, the main characteristics of the operational phase, and estimate of expected residues and emissions.

Part 2:

- **'A description of the reasonable alternatives studied by the developer'** – for example with regard to development design, technology, location, size and scale, and an indication of the main reason for selecting the chosen option.

Part 3:

- 'A description of the relevant aspects of the current state of the environment (baseline scenario)'- including how the baseline might evolve if the development were not to proceed.

Part 4:

- **'A description of the factors specified in regulation 4(2) likely to be significantly affected by the development'** – including with regard to population, human health, biodiversity (for example fauna and flora), land (for example land take), soil (for example organic matter, erosion, compaction, sealing), water (for example hydromorphological changes, quantity and quality), air, climate (for example greenhouse gas emissions, impacts relevant to adaptation), material assets, cultural heritage, including architectural and archaeological aspects, and landscape.

Part 5:

- **'A description of the likely significant effects of the development on the environment'** - including with regard to: construction, existence and demolition works, the use of natural resources, emission of pollutants and the disposal of waste, the risks to human helath, cultural heritage or the environment (for example due to accidents or disasters), cumulative effects with other developments, vulnerability with respect to climate change and the technologies and substances to be used.
- The description of the likely significant effects should cover 'direct effects and any indirect, secondary, cumulative, transboundary, short-term, medium-term and long-term, permanent and temporary, positive and negative effects of the development'

Part 6:

- **'A description of the forecasting methods or evidence, used to identify and assess the significant effects on the environment'** - including details of difficulties (technical deficiencies or lack of knowledge) encountered compiling the required information and the main uncertainties involved**.**

Part 7:

- 'A description of the measures envisaged to avoid, prevent, reduce or, if possible, offset any identified significant adverse effects on the environment' - including

where appropriate with regard to: any proposed monitoring arrangements (for example the preparation of a postproject analysis).

- The description should explain the 'extent, to which significant adverse effects on the environment are avoided, prevented, reduced or offset', and should cover both the construction and operational phases.

Part 8:

- 'A description of the expected significant adverse effects of the development on the environment deriving from the vulnerability of the development to risks of major accidents and/or disasters which are relevant to the project concerned'. Where appropriate, this description should include measures envisaged to prevent or mitigate the significant adverse effects of such events on the environment and details of the preparedness for and proposed response to such emergencies.

Part 9:

- 'A non-technical summary of the information provided under paragraphs 1 to 8'.

Part 10:

- 'A reference list detailing the sources used for the descriptions and assessments included in the environmental statement'.

3.2 The EIA Process

3.2.1 Each of the topic areas 'scoped in' the EIA, will undergo the following main steps:

Baseline Studies

3.2.2 In the case of many of the environmental topics which will be covered in the ES, or which are proposed to be scoped-out of the ES, baseline studies have already been undertaken, and details of this work, where relevant, are discussed within each environmental topic **within** this Report. Baseline conditions will be established within each of the individual environmental assessments through the use of a number of sources including, desk top review of existing available data; site specific survey work; and consultation.

Assessment of Environmental Effects and Evaluation of Significance

3.2.3 The EIA Regulations require that the ES identifies 'likely significant effects of the Proposed Development on the environment'. It is recognised in the EIA Regulations however that not all environmental effects are considered significant.

3.2.4 The evaluation and determination of significant effects will be carried out using specific criteria defined within each of the technical chapters of the ES. Where available, published standards and guidelines will be used as the basis for the significance criteria.

3.2.5 The proposed methodologies for individual environmental topics are discussed in the subsequent section. However, in many disciplines the following basic approach is utilised:

- The sensitivity of the receiving environmental receptor is evaluated using defined criteria.

- The nature of the impact is established in terms of its duration, extent, frequency, likelihood of occurrence, reversibility, and compliance with recognised standards;
- The magnitude of the impact is determined. The magnitude of change is a consideration of how much the impact alters the baseline condition.
- The significance of the effect is determined by cross referencing the sensitivity of the receptor with the magnitude of change on the receptor.

3.2.6 It should be noted that environmental effects may be direct or indirect, secondary, cumulative, transboundary, short, medium, long-term, permanent and temporary, positive and negative effects of the development and this will be noted in the ES. Effects will be considered both during the construction phase, when the development is being built (often temporary effects) and following completion of the development (often permanent effects). Given the nature and intended longevity of the Proposed Development's operational life, decommissioning is not appropriate to consider. Accordingly, the ES will focus on the potential likely significant effects during the construction and operational phases only. Consideration will however be given to effects from major accidents and disasters where relevant.

Mitigation Measures and Residual Effects

3.2.7 Following the assessment of effects, mitigation measures to reduce and avoid these effects will be identified and detailed. Mitigation measures considered may include modification of the proposals, integral mitigation, or secondary measures. Any residual effects following the implementation of mitigation measures will be determined accordingly. The residual effects represent the overall likely significant effect of the Proposed Development on the environment having taken account of practicable/available mitigation measures.

Cumulative and In-combination Effects

3.2.8 The ES will respond to the requirement in the Regulations to assess the cumulative effects of the Proposed Development which will specifically consider two types of effect:

- Intra-project Cumulative Effects: The combined effect of individual effects (for example noise, airborne dust or traffic) on a single receptor where deemed potentially significant; and
- Inter-project Cumulative Effects: The combined effects of development schemes which may, on an individual basis be insignificant but, cumulatively, have significant effect.

3.2.9 With respect to inter-project cumulative effects, the Regulations state that consideration should be given to "*other existing and/or approved projects*" (Schedule 4, 5e). This is further supported by the National Planning Policy Guidance (NPPG) which states "*There are occasions.....when other existing or approved development may be relevant in determining whether significant effects are likely as a*

consequence of a proposed development." (Paragraph: 024 Reference ID: 4-024-20170728)

3.2.10 Regard will therefore be had to relevant "*existing and/or approved projects*", which alongside the development of the proposals at the Application Site, could potentially result in cumulative significant effects.

3.2.11 The below "*existing and/or approved projects*" have been identified:

- Radstone Fields c. 280m north east from the Site: An urban extension comprising up to 1000 new homes, including highway access arrangements from Halse Road and Radstone Road, local centre including community hall with uses within A1-A5 inclusive (up to 1000 square metres), a site for a new primary school, open space and associated physical infrastructure (S/2010/0995/MAO). This application was approved in 2010 and the majority now constructed and occupied. A small number of dwellings are still under construction, however these will be operational by the time the subject site starts construction.
- Land South West of Field View c. 1.8km south from the Site: Outline application for Residential Development comprising up to 68 dwellings; access from Field View; open space and storm water attenuation, associated infrastructure (reference: S/2016/0331/MAO). Approved 10/05/20 and currently under construction. This is likely to be constructed and occupied by the time the subject site starts construction.
- Land South of Turweston Road c. 1.5km east from the SIte: Residential development comprising up to 350 dwellings and access from Turweston Road (reference: S/2011/0141/MAO). Approved 10/02/2014.

3.2.12 In relation to the approach in assessing cumulative sites of 'other developments' which are under construction, the Planning Inspectorate Advice Note 17: Cumulative Effects Assessment (Version 2) August 2019 States:

> "***where other projects are expected to be completed before construction of the proposed NSIP and the effects of those projects are fully determined, effects arising from them should be considered as part of the baseline and may be considered as part of both the construction and operational assessment. The ES should clearly distinguish between projects forming part of the dynamic baseline and those in the CEA" (Cumulative Environmental Assessment***)"

3.2.13 Since the above schemes at Radstone Fields and Field View are expected to be completed before the construction of the Proposed, on this basis, the ES has sought to include the above proposals within the 'future baseline' i.e. a baseline that already includes the effects of the two above schemes within it. It is acknowledged that the residential development at Turweston Road is not likely to be completed before construction of the subject Site, therefore consideration to cumulative impacts will

be given to this scheme in relation to relevant disciplines. The applicant welcomes confirmation of this approach.

3.2.14 Whilst this Scoping Report seeks to identify relevant schemes to be considered, it is to be acknowledged that the extent to which schemes need to be considered within each environmental discipline will inevitably vary.

3.2.15 It is also recognised that a planning application north of Radstone Fields has recently been submitted (December 2020), as described below:

- Outline application with all matters except reserved except access, for the provision of up to 450 dwellings, including public open space and a cemetery together with associated infrastructure including foul and storm water drainage installations and electricity supply substations, full details of access arrangements from Halse Road comprising four new access points - two primary and one secondary South of Worlidge and one secondary North of the Worlidge to serve sports pitches. One primary vehicular access point from Miranda Way including reformatting of existing junction of Miranda Way with Juno Crescent and one secondary access for pedestrian and cycle connection, access track from Halse Road and small car park to serve sports pitches (reference: S/2020/2163/MAO). This application was received by the council on 24th November 2020 and is currently being consulted on. Adjacent to the Application Site.

3.2.16 This development is not existing or approved, nor can it be considered as "reasonably foreseeable" development (as referred to within the European Guidance). It is therefore not proposed this is considered as part of cumulative impacts.

3.2.17 On review of recent planning approvals and planning application submissions in the surrounding councils, the team is not aware of any other projects within the vicinity of the Site which would be required to be considered as part of a cumulative assessment, however the applicant welcomes confirmation.

3.3 Preparation of the ES

3.3.1 In accordance with the Regulations, the ES will be prepared by "competent experts", as listed at the outset of this report. A statement outlining the relevant experience of the experts who have undertaken the assessment and drafted the technical chapters within the ES will be provided. It is also noted the Regulations now require decision makers to ensure they have 'necessary skills in house'.

4. Proposed Scope of The EIA and Environmental Statement Chapters

4.1 Environmental Topics

4.1.1 **Table 4.1** lists the environmental topics specified within the EIA Regulations as to potentially be considered as part of the EIA process. The table also summarises whether these topics are considered relevant to include within the EIA process, and where such topics will be considered within the ES where applicable. Where a topic has been scoped out, the reasoning is provided within Section 6.

Table 4.1 Environmental Topics as per EIA Regulations

EIA Topic	Scoped In / Out	Where Addressed within ES
Population	Scoped in	To be assessed within the Socio Economic and Human Health chapter
Human Health	Scoped in	To be assessed within various chapters as follows: Socio Economic and Human Health, Air Quality, Landscape and Visual and Transport
Biodiversity (e.g. flora and fauna)	Scoped in	To be assessed within the Ecology and Nature Conservation chapter
Land (e.g. land take)	Scoped in	To be assessed within the Landscape and Visual, Ecology and Ground Conditions Chapters.
Soil	Scoped in	To be assessed within the Ground Conditions Chapter. (agricultural land is proposed to be scoped out – see section 5)
Water	Scoped in	To be assessed within the Flood Risk and Drainage, and Ecology and Nature Conservation chapters
Air	Scoped in	To be assessed within the Air Quality chapter
Climate	Scoped in/out	Climate to be assessed within various chapters as follows: Air Quality, Ecology, and Flood Risk and Drainage. It is not considered that there will be a significant impact in relation to 'climate change' in EIA terms. It is therefore not proposed to include a specific chapter regarding climate change mitigation and adaptation (refer to Section 6 for further discussion).
Material Assets	Scoped out	It is not considered there are any further 'material assets' to those already addressed within other EIA topics that may result in further significant effects (refer to Section 6)
Cultural Heritage (Architectural & Archaeological aspects)	Scoped in	To be assessed within the Archaeology and Heritage Chapter
Landscape	Scoped in	To be assessed in the Landscape and Visual chapter
Interrelationship between above factors	Scoped in	Within each topic chapter

4.1.2 In the context of the above environmental topics, it is proposed that the resultant ES will include the following chapters:

- Introduction
- EIA Scope and Methodology
- Application Site
- Proposed Development and Alternatives
- Planning Policy
- Socio Economic Issues and Human Health
- Landscape and Visual Issues
- Ecology and Nature Conservation (Biodiversity)
- Lighting
- Archaeology and Cultural Heritage
- Transport and Access
- Noise and Vibration
- Air Quality
- Flood Risk and Drainage
- Ground Conditions
- Summary
- A separate Non-Technical Summary will also be provided

4.1.3 The proposed scope of these individual chapters is discussed within the rest of this Section.

Front End Introductory Chapters

4.2 Introduction

4.2.1 This chapter of the ES will provide an introduction to the document and present details of the ES's structure and context, in addition to how consultees and members of the public can comment on the document or obtain additional copies.

4.3 EIA Scope and Methodology

4.3.1 This chapter provides a summary of the agreed scope of assessments to be considered within the ES, with reference to consultation responses and explains the methodology used to prepare the technical chapters, including reference to the general approach in determining significance. Information in relation to cumulative impacts is also set out within this chapter, along with any limitations or assumptions used throughout the ES.

4.4 Application Site

4.4.1 This chapter will describe the Application Site's location, context, existing use and features.

4.5 Proposed Development and Alternatives

4.5.1 This chapter will provide a comprehensive description of the Proposed Development, including the construction process, and any relevant details on assumed timescales and phasing.

4.5.2 The EIA will be based upon a set of defined parameters, which will identify the extent of different land use areas (e.g. residential, open space, roads etc), maximum heights of buildings and key landscape mitigation proposals integral to the scheme.

4.5.3 The parameters approach ensures that subsequent approvals and/or reserved matters will remain the same as that assessed within the ES. These parameters and controls define those aspects of the Proposed Development capable of having significant effects, as defined in the EIA Regulations. This ensures that key elements are assessed accordingly, however allows some flexibility for detail post submission.

4.5.4 The chapter will also provide a description of the reasonable alternatives (for example in terms of development design, technology, location, size and scale) studied by the developer, which are relevant, and an indication of the main reasons for selecting the chosen option, including a comparison of the environmental effects.

4.6 Planning Policy

4.6.1 A summary of the relevant planning policy will be presented, against which the various environmental topics addressed in the ES will be considered. Policy will be identified at the national, regional and local level as appropriate.

4.6.2 The Development Plan currently consists of:

- Adopted Development Plan
  - The Adopted West Northamptonshire Joint Core Strategy (2014) (prepared by the West Northamptonshire Joint Planning Unit (JPU) (formed of the three Councils of Daventry District, Northampton Borough and South Northamptonshire)[1] and
  - South Northamptonshire Local Plan (Part 2) 2011-2029[2]
- The Brackley Masterplan, adopted January 2011
- Supplementary Planning Documents and Guidance

[1] West Northamptonshire Joint Core Strategy Local Plan Part 1 (Adopted 15 December 2014). This adopted Joint Core Strategy covers the administrative areas of Daventry District, Northampton Borough and South Northamptonshire District. The Joint Core Strategy sets out the long-term vision and objectives for the whole of the West Northamptonshire area for the plan period up to 2029, and includes strategic policies to steer and shape development.

[2] South Northamptonshire Local Plan Part 2 (Council resolved to Adopt 22 July 2020). The plan builds on the West Northamptonshire Joint Core Strategy, it was prepared to help further guide planning decisions in the area and forms part of the Development Plan for the District, along with the West Northamptonshire Joint Core Strategy and neighbourhood plans.

Discipline Specific Chapters

4.7 Social Economic Issues and Human Health

Introduction

4.7.1 Produced by Turley Economics, this section reports the scoping process leading to the identification of the likely significant environmental effects arising from the Proposed Scheme in relation to socio-economics and human health.

4.7.2 This includes an outline of the scope of the assessment and the assessment methodology, as well as a summary of baseline conditions. Analysis of these baseline conditions contributed to the identification of effects which are likely to be significant and has enabled a number of effects to be scoped out of the assessment as likely to be not significant.

Relevant Policy and Guidance

4.7.3 There is no formal legislation of relevance to the assessment of effects in terms of socio-economics and human health. The assessment of this discipline is therefore informed by best-practice guidance including:

- Homes and Communities Agency (HCA) Additionality Guide 4th Edition[3]; and
- NHS Healthy Urban Development Unit (HUDU) Rapid Health Impact Assessment Tool 4th Edition[4].

Preliminary Assessment of Baseline Conditions

4.7.4 The ONS's 2019 Population Estimates[5] found that a total of c. 94,500 people reside in the local authority of South Northamptonshire. This accounts for c. 6% of the total population of the wider South East Midlands Local Enterprise Partnership (SEMLEP) area[6], which itself is populated by 1.67 million residents.

4.7.5 Valuation Office Agency (VOA) data[7] shows that South Northamptonshire accommodated c. 40,700 residential properties as of 2020, rising to 715,900 at the scale of the SEMLEP area. Data published by the Ministry of Housing, Communities and Local Government (MHCLG)[8] indicates that between 2015/16 and 2019/20, a total 3,223 net additional homes were delivered in South Northamptonshire, averaging 645 per annum.

4.7.6 The Department for Education's (DfE) 'Get Information About Schools' online search tool[9] indicates that there are a total of 4 primary schools (plus an infants' school, offering places only to 5-7 year olds) within 2 miles and one secondary school within

[3] Homes and Communities Agency (2014) Additionality Guide 4th Edition
[4] NHS Healthy Urban Development Unit (2019) Rapid Health Impact Assessment Tool
[5] ONS via Nomis (2020) Population Estimates: 2019
[6] Comprising the local authorities: Bedford; Central Bedfordshire; Cherwell; Corby; Daventry; Luton; Milton Keynes; Kettering; Northampton and South Northamptonshire.
[7] Valuation Office Agency (2020) Council Tax: stock of properties, 2020
[8] Ministry of Housing, Communities and Local Government (2020)
[9] Department for Education (2020) Get Information About Schools [Online]. Available at: https://www.get-information-schools.service.gov.uk/

3 miles from the Site, these distances representing the maximum distances that children should travel to access these phases of education[10]. As recorded by the DfE's January 2020 School Census[11], the relevant primary schools have combined spare capacity for 587 pupils. 284 of these available places are at The Radstone Primary School, located 0.5 miles walking distance from the northern edge of the site. The identified secondary school (Magdalen College School, approximately 1.0 miles walking distance from the Site) has spare capacity for 135 additional pupils.

4.7.7 Two GP surgeries - Springfield Surgery and Brackley Medical Centre – are identified in the Brackley locality. Guidance from the Royal College of GPs published by the NHS HUDU[12] outlines that 1 full-time equivalent (FTE) GP per 1,800 patients is an appropriate ratio in terms of healthcare provision. Whilst there appears to be inconsistencies in 2020 NHS GP Workforce data related to disruption caused by the Covid-19 pandemic[13], analysis of provision as of September 2019 indicates that there is available capacity to accommodate c. 1,500 additional patients at Brackley Medical Centre based on this ratio. The latest data indicates that Springfield Surgery should be considered to be operating at near-capacity.

4.7.8 Data sourced from Pitney Bowes[14] estimates that total annual household retail expenditure in South Northamptonshire in 2020 will have equated to c. £657 million, with average household expenditure equating to £17,200. Total annual household expenditure on leisure-related goods and services in the authority in 2020 is estimated as c. £355 million, with the average household spending c. £9,300.

4.7.9 South Northamptonshire Council's 2019/20 Draft Statement of Accounts[15] indicates that the authority collected £10.0 million in Council Tax in 2019/20. This has been increasing year-on-year for the past 5 years, and therefore 2019/20's collection is higher than the 5-year average of £9.0 million.

4.7.10 A total of 37,000 (workplace-based) jobs are recorded within South Northamptonshire, representing 4% of the total 852,000 recorded across the SEMLEP area . The construction sector supports 2,250 jobs within South Northamptonshire, increasing to 38,000 in the sector at the scale of the wider SEMLEP area[16]. The construction sector therefore makes a slightly greater contribution to total employment in South Northamptonshire (providing 6% of jobs in the authority) than in the wider SEMLEP area (where it provides 4% of jobs).

4.7.11 ONS data[17] suggests that a total of 210 people are claiming Jobseekers Allowance and specifically seeking work in the construction sector in South Northamptonshire as of November 2020, expanding to 4,425 seeking this type of work at the scale of

[10] HM Government (1996) Education Act 1996
[11] Department for Education (2020) Get Information About Schools [Online]. Available at: https://www.get-information-schools.service.gov.uk/
[12] NHS Healthy Urban Development Unit (2009) HUDU Planning Contribution Model: Guidance Notes
[13] NHS Digital (2020) General Practice Workforce: September 2020; September 2019 [Online]. Available at: https://digital.nhs.uk/data-and-information/publications/statistical/general-and-personal-medical-services/30-september-2020.
[14] Pitney Bowes via GeoInsight (2020) Local Authority Household Expenditure: 2020
[15] South Northamptonshire Council (2020) Statement of Accounts for the year 2019/20 (Draft Subject to Audit)
[16] ONS via Nomis (2020) Business Register & Employment Survey: 2019
[17] ONS via Nomis (2020) Jobseekers Allowance by Occupation: November 2019; November 2020

the SEMLEP area. These figures have grown notably in both areas in the wake of the Covid-19 pandemic, with zero people in South Northamptonshire and 65 people in the SEMLEP area having been recorded as seeking construction employment in November 2019. Indeed, the total number of people registered as claiming all types of benefits relating to unemployment grew substantially at both spatial scales during this period – increasing by 269% in South Northamptonshire and by 153% in the SEMLEP area[18].

4.7.12 Analysis of Public Health England data[19] highlights several indicators for which South Northamptonshire records better health outcomes than recorded in the East Midlands[20] and nationally. Life expectancies for both men (81 years) and women (85 years) are higher in South Northamptonshire than recorded in the East Midlands (respectively 79 and 83 years) and nationally (respectively 80 and 83 years). A lower proportion of adults in South Northamptonshire are classified as overweight or obese (61%) than in both the East Midlands (64%) and nationally (at 62%). Similarly, childhood obesity is less prevalent in South Northamptonshire (where 14 % of Year 6 children are obese) than in the East Midlands or England (both 20%). A higher percentage of adults are also physically active[21] (69%) in South Northamptonshire in comparison with the East Midlands and England as a whole (both 66%).

4.7.13 South Northamptonshire's Council's Open Space Strategy (OSS) 2007-21[22] states that provision of open space in Brackley is "fairly well-spread", with varying types of open spaces (including natural and semi-natural; children's play; amenity green space; space for young people/teenagers; outdoor sports facilities; allotments) available for the use of residents.

Potential Impacts/Effects

Identification of Effects which are Not Significant

4.7.14 The assessment of socio-economic and human health effects considers the impacts of the Proposed Scheme on its future residents and existing residents in the local area.

4.7.15 The following effects have been identified and are not considered significant. They will not be considered further with the EIA or reported in the ES. A factual evidence base has been provided below to support this.

Social and neighbourhood cohesion

4.7.16 The Site of the Proposed Scheme is currently agricultural land and therefore its redevelopment will not result in the displacement of any existing residential communities. The Scheme's location to the immediate edge of the west of Brackley town will enable coherent integration with the town's existing residential areas and

[18] ONS via Nomis (2020) Claimant Count: November 2019; November 2020
[19] Public Health England (2020) Local Authority Health Profiles 2019: South Northamptonshire
[20] Comparable Public Health England data only available at the regional level, as opposed to the SEMLEP area.
[21] Defined as undertaking a minimum of 150 minutes (2.5 hours) of moderate physical activity per week in bouts of 10 minutes or more
[22] South Northamptonshire Council (2007) Open Space Strategy 2007 - 2021

its proposed design and multiple access points means that it will be effectively linked with the schools, shops and other facilities available within Brackley. Provision of external amenity space within the Proposed Scheme will also support opportunities for social interaction and cohesion for those residing on the completed scheme.

4.7.17 Therefore, given the inherent mitigation supported by the Scheme's location and design, impact on social and neighbourhood cohesion is not considered to be significant and will not be considered further within the EIA or reported in the ES.

Crime levels and community safety

4.7.18 The site security arrangements for the Proposed Scheme during the construction phase will be in line with the requirements set out in the Construction (Design and Management) Regulations 2015. The design of the Proposed Scheme includes 'Secure by Design' principles and appropriate measures to ensure community safety.

4.7.19 Therefore, given the proposed mitigation, impact on crime levels and community safety is unlikely to be considered significant and will not be considered further within the EIA or reported in the ES.

Access to active travel and sustainable travel options

4.7.20 Safe pedestrian routes link the site with the services – including shops, schools, health and leisure facilities – located within walking distance in Brackley. The green infrastructure within the Proposed Scheme links to the existing active travel routes within the town, allowing safe movement and connections to and from the wider area.

4.7.21 There are four principal bus routes within the vicinity of the site. Bus stops are located on Pavilions Way (approximately 450m walking distance from the northern access junction) which are served by the 500 and the X91. Further bus stops on Pavillions Way (approximately 750m walking distance from the centre of the site) are served by the 80, X80 and X91 services. The 500 service offers a half hourly service between Brackley town centre and Banbury. Banbury Railway Station is approximately 11.5 km to the north-west of the site and can be reached by public transport (500 bus services and a 320-metre walk from the bus stop).

4.7.22 Therefore, given the inherent mitigation supported by the Scheme's location and design, impact on access to active travel and sustainable travel options is unlikely to be considered significant and will not be considered further within the EIA or reported in the ES.

Access to healthy food

4.7.23 There are a number of supermarkets located in Brackley, including Waitrose, Tesco and Co-op, which are accessible from the site, thereby providing a range of healthy food options to future residents located on Site.

4.7.24 Therefore, given the inherent mitigation supported by the Scheme's location, impact on access to healthy food is unlikely to be considered significant and will not be considered further within the EIA or reported in the ES.

Growth in household expenditure

4.7.25 As outlined in the baseline, total household retail and leisure expenditure in South Northamptonshire is estimated to total £657 million and £355 million respectively in 2020, with the average household spending £17,200 on retail and £9,300 on leisure. Consequently, it is estimated that 700 households living at the Proposed Scheme will spend a total of £12.1 million on retail and £6.5 million on leisure per annum. Whist this additional expenditure will be beneficial in helping to support local businesses and high streets in South Northamptonshire, it is of a scale that equates to a low proportion - just 1.8% - of total annual household retail and leisure expenditure in the authority.

4.7.26 Therefore, given the low impact on baseline conditions, growth in household expenditure is unlikely to be considered significant and will not be considered further within the EIA or reported in the ES.

Identification of Likely Significant Effects and Receptors

4.7.27 The following effects shown in **Table 4.2** below have been identified and will be assessed within the EIA and reported in the ES.

Table 4.2 Likely Significant Effects and Receptors

Effect	**Receptor**	**Applicable Development Phase (Construction or/and Operational)**
Employment generated during the construction phase	Labour force residing in the local and wider impact areas	Construction
Provision of housing (including affordable housing)	People requiring housing of all tenures in the local area.	Operational
Local authority revenue (Council Tax)	South Northamptonshire Council revenues	Operational
Demand for education provision (primary and secondary)	Primary and secondary schools located within 2 and 3 miles of the Site and their pupils	Operational
Demand for health care infrastructure (GPs)	Primary health care facilities located within the Brackley locality and their patients.	Operational
Access to open space	Residents accessing open space within the relevant access standards from the Site	Operational

4.7.28 Please note that other environmental effects on health associated with the generation of noise, changes to the air quality and transport will be addressed in the 'Noise and Vibration'; 'Air Quality' and 'Transport' chapters included in the ES.

Scope and Methodology of Assessment

Assessment Methodology of Likely Significant Effects

4.7.29 The following methodology for assessment is proposed:

- Appropriate study areas will be defined, which – in the absence of formal guidance – will be based on an understanding of relevant local and wider economic geographies and a consideration of the extent to which socio-economic and human health effects are likely to be captured therein. The local authority of South Northamptonshire will form the local impact area and the SEMLEP area will form a wider impact area. This reflects existing evidence of labour force containment from the 2011 Census[23].
- Best practice and methodological guidance will be drawn upon as appropriate to inform key elements of the assessment, including the Additionality Guide (4th Edition)[24] published by the Homes and Communities Agency (HCA, the body now known as Homes England) and the HUDU Rapid Health Impact Assessment Toolkit (4th Edition)[25]. Economic impact modelling will be conducted in line with HCA guidance for relevant effects, which will enable net additional economic impacts to be estimated, accounting for leakage, displacement and multiplier effects. HUDU guidance informed the identification of likely significant and not significant human health effects as set out in this scoping chapter, and will continue to provide the framework to understand and assess the manner and extent to which identified likely significant effects impact on sensitive receptors in terms of human health[26].
- The sensitivity of receptors will be determined through comparison with local, regional and national trends. Through observation of a receptor's capacity for change relative to wider comparator areas and/or national standards, the sensitivity of receptors locally can be observed. Consideration is also given to the priority attributed to specific receptors in strategy and policy terms, particularly

[23] ONS via Nomis (2011) 2011 Census. The Census found that 42% of jobs in South Northamptonshire are taken by residents of the district and 81% of jobs in South Northamptonshire are taken by residents of the SEMLEP area. This therefore indicates that the majority of significant socio-economic effects generated by the Proposed Scheme would be contained within this wider geography.
[24] Homes and Communities Agency (2014) Additionality Guide 4th Edition
[25] NHS Healthy Urban Development Unit (2019) Rapid Health Impact Assessment 4th Edition
[26] It should be noted that, whilst HUDU guidance informs the EIA, a separate Health Impact Assessment using the HUDU Rapid HIA Tool will not be conducted as part of the EIA.

in the case of qualitative receptors and those where there may be a shortage of quantitative evidence. The assessment is based on professional judgment.

- Once the sensitivity of the receptor has been identified, the magnitude of change associated with the Proposed Scheme will be benchmarked against the current rate of change in the corresponding social, economic or health baseline.

4.7.30 The assessment of likely significant effects to sensitive receptors will consider the sensitivity of the receptor (on a scale of high, medium, low and negligible) and the magnitude of change (on a scale of large, medium, small and negligible) to determine significance on a scale of major, moderate, minor and negligible. Significant effects will be determined through professional judgment.

Limitations and Assumptions

4.7.31 To ensure transparency within the EIA process, the following limitations and assumptions have been identified.

- The assessment is desk-based and therefore reliant on data and information obtained from a variety of official published sources. No further verification of these sources will be undertaken.
- Where necessary, professional and realistic assumptions will be made and applied.

Preliminary discussions of mitigation and enhancement measures

4.7.32 For several effects, it is considered that consultation with relevant bodies would assist in determining the impact of the Proposed Scheme and the identification of any necessary mitigation and enhancement measures. These effects and the relevant bodies who could potentially be consulted are as follows:

Table 4.3 Potential Consultation to Determine Effects and Identify Mitigation and Enhancement Measures

Effect	Consultee Body
Demand for education provision (primary and secondary)	Northampton County Council – Local Education Authority
Demand for health care infrastructure (GPs)	Northamptonshire Clinical Commissioning Group
Access to open space	South Northamptonshire Council

4.8 Landscape and Visual Issues

Introduction

4.8.1 This section sets out the proposed scope and approach to assessing potential direct and indirect impacts of the Proposed Development on landscape and visual amenity receptors during construction, operation and decommissioning phases. Within this section, preliminary baseline data will be presented and potential effects that may arise as a result of the Proposed Development will be outlined.

4.8.2 Landscape and visual effects are closely linked which means there is some overlap of assessment methodology, although the two topics are assessed separately. Landscape assessment deals with the assessment of effects on the landscape as a resource in its own right, whilst assessment of visual effects considers the effects on specific views and on the general visual amenity experienced by people (visual receptors).

4.8.3 The methods of assessment to be used are based on the broad principles established, and approaches recommended in, the following best practice guidance:

- Guidelines for Landscape and Visual Impact Assessment, Third Edition (GLVIA3)[27];
- An Approach to Landscape Character Assessment[28];
- An Approach to Landscape Sensitivity Assessment – to inform spatial planning and land management[29];
- The State of Environmental Impact Assessment Practice in the UK[30]; and
- Landscape Institute Technical Guidance Note 06/19 Visual Representation of Development Proposals[31].

Relevant Policy and Guidance

European Landscape Convention

4.8.4 The European Landscape Convention[32], which was ratified in the UK in 2006 defines landscape as: 'an area, as perceived by people, whose character is the result of the action and interaction of natural and/ or human factors.' The fact that an area of landscape is not designated either nationally or locally does not mean that it does not have any value. The European Landscape Convention promotes the need to take

[27] Guidelines for Landscape and Visual Impact Assessment, Third Edition (2013), The Landscape Institute and Institute of Environmental Management and Assessment
[28] An Approach to Landscape Character Assessment (2014), Natural England
[29] An Approach to Landscape Sensitivity Assessment – to inform spatial planning and land management (2019), Natural England
[30] The State of Environmental Impact Assessment Practice in the UK (2011), Institute of Environmental Management & Assessment
[31] Landscape Institute Technical Guidance Note 06/19 Visual Representation of Development Proposals (2019), Landscape Institute
[32] European Landscape Convention ETS No.176 ratified on the 21st November 2006

account of all landscapes, with less emphasis on the special and more recognition that ordinary landscapes also have their value.

National Planning Policy Framework

4.8.5 National landscape policy is found within the National Planning Policy Framework (NPPF), February 2019[33]

4.8.6 The NPPF aims to provide a national planning framework within which the local community and local authorities can produce distinctive local plans which respond to local needs and priorities, which can then be used to determine planning applications. The purpose of the planning system is to contribute to achieving sustainable development, defined as, *'meeting the needs of the present without compromising the ability of future generations to meet their own needs.'* (Page 5, para. 7).

4.8.7 The NPPF identifies a number of aspects to consider and protect landscapes including:

1. *Planning policies and decisions should ensure that developments are sympathetic to local character and history, including the surrounding built environment and landscape setting, while not preventing or discouraging appropriate innovation or change (such as increased densities)'* (Page 38, para. 127 c).

2. *'Planning policies and decisions should contribute to and enhance the natural and local environment by protecting and enhancing valued landscapes, sites of biodiversity or geological value and soils (in a manner commensurate with their statutory status or identified quality in the development plan)';* (Page 49, para. 170 a);

3. *'Planning policies and decisions should contribute to and enhance the natural and local environment by recognising the intrinsic character and beauty of the countryside, and the wider benefits from natural capital and ecosystem services – including the economic and other benefits of the best and most versatile agricultural land, and of trees and woodland';* (Page 49, para. 170 b).

4. *'Plans should: distinguish between the hierarchy of international, national and locally designated sites; allocate land with the least environmental or amenity value, where consistent with other policies in this Framework; take a strategic approach to maintaining and enhancing networks of habitats and green infrastructure; and plan for the enhancement of natural capital at a catchment or landscape scale across local authority boundaries.'* (Page 49, para. 171).

5. *'Great weight should be given to conserving and enhancing landscape and scenic beauty in National Parks, the Broads and Areas of Outstanding Natural Beauty, which have the highest status of protection in relation to these issues.'* (Page 49, para. 172).

[33] The Department of Housing, Communities and Local Government (2019)

Local Development Plans

4.8.8 All Local Planning Authorities are responsible for the protection of landscape within the planning system and the formulation of policies to support this obligation. Treatment of the landscape within the planning process relevant to the proposed development is covered by policies contained within the Local Plan.

4.8.9 Within the LVIA consideration will be given to policies relating to landscape character contained within West Northamptonshire Joint Core Strategy Local Plan Part 1[34] and South Northamptonshire Local Plan Part 2[35].

4.8.10 An initial review of these policies has identified that the site is not located within a defined 'settlement confine' and is therefore in open countryside. In addition the site is not associated with any specific proposals nor earmarked for specific protection or development.

4.8.11 A woodland belt along the path of a dismantled railway running north-west to south-east adjacent to the site's southern boundary is identified as 'Brackley to Banbury via Farthinghoe' Green Infrastructure Corridor in South Northamptonshire Local Plan Part 2 Policy NE3: Green Infrastructure Corridors.

Preliminary Assessment of Baseline Conditions

4.8.12 Assessments of the baseline landscape and visual conditions will be undertaken in parallel and will be informed by a combination of desk and field-based techniques. Preliminary identification, description and evaluation of the existing landscape character and visual amenity of the study area will involve a desk-based review and consideration of the following information sources:

- Ordnance Survey mapping and aerial photography relating to existing landform, vegetation, settlement patterns, promoted viewpoints and drainage regimes;
- Plans containing information relating to landscape designations and landscape related policies at the local and national level;
- Schematic plans relating to the proposed development;
- The Multi-Agency Geographical Information for the Countryside database (MAGIC, Defra);
- National Landscape Character Areas (NCA) as defined by Natural England[36]; and

[34] West Northamptonshire Joint Core Strategy Local Plan Part 1 (Adopted 15 December 2014). This adopted Joint Core Strategy covers the administrative areas of Daventry District, Northampton Borough and South Northamptonshire District. The Joint Core Strategy sets out the long-term vision and objectives for the whole of the West Northamptonshire area for the plan period up to 2029, and includes strategic policies to steer and shape development.
[35] South Northamptonshire Local Plan Part 2 (Council resolved to Adopt 22 July 2020). The plan builds on the West Northamptonshire Joint Core Strategy, it was prepared to help further guide planning decisions in the area and forms part of the Development Plan for the District, along with the West Northamptonshire Joint Core Strategy and neighbourhood plans.
[36] Natural England has identified 159 separate National Character Areas (NCA) within England. The NCA follow natural lines in the landscape, rather than administrative boundaries, and share similar landscape characteristics. NCA profiles are guidance documents which can help to inform the decision-making process.

- Northamptonshire Current Landscape Character Assessment (NCLCA)[37].

4.8.13 A field survey would be undertaken during the EIA process to confirm and ground truth the desk-based findings.

4.8.14 An understanding of the baseline conditions is necessary to inform:

- An understanding of the landscape in the study area: its constituent elements; its character and the way that this varies spatially; its geographic extent; its historical features; condition; the way that it is experienced; and the value attached to it; and
- An understanding of the areas from which the proposed development may be visible, the different groups of people (visual receptors) who may be affected and the nature of the views and visual amenity currently experienced at those locations.

The Site

4.8.15 The site covers approximately 34ha across six regular shaped arable fields adjacent to the north-west boundary of the small town of Brackley. The fields are enclosed by mature hedgerows and woodland strips, which provide a degree of enclosure around the site. There are further hedgerows separating the fields within the site. Beyond the hedgerow boundaries the site is surrounded on all sides by arable fields, other than the suburban edge of Brackley along the eastern boundary of the site. The site is located on a broadly south-west facing slope with the northern end of the site at around 147m AOD and the southern end of the site around 114m AOD. A public right of way (PRoW) VA19 runs through the north of the site from west to east along the length of the one of the internal field boundaries. A woodland belt along the path of a dismantled railway runs north-west to south-east adjacent to the site's southern boundary.

4.8.16 The A422, which connects Brackley with Banbury to the north-west and Buckingham to the south-east, passes 60m south of the site's southern boundary; and Halse Road, which connects Brackley to Halse, is adjacent to the northern site boundary.

The Study Area

4.8.17 For the reasons detailed below it is proposed that the study area for the LVIA extends to 2km from the site boundary. This notional study area is wholly within the authority of Northamptonshire County Council. The town of Brackley occupies the south-eastern quadrant of the study area. The remainder of the study area is an agricultural landscape comprised of irregular shaped fields, which are a mix of pastoral and arable use, with mature hedgerow boundaries. Although the site itself is enclosed by strips

[37] Northamptonshire Current Landscape Character Assessment (2003), LDA Design on behalf of Northamptonshire County Council

of mature woodland and hedgerows there are minimal blocks of woodland within the wider landscape. Exceptions are Brackley Gorse and Gooseholm Copse to the west of the site and the mature woodland strip which follows the path of a dismantled railway to the south-west and west of the site.

4.8.18 In addition to the town of Brackley, the village of Hinton-in-the-Hedges is located 1.5km south-west of the site boundary and the village of Halse is located 1.9km north-west of the site boundary. Within the study area a busy highway network is focused around the town of Brackley.

4.8.19 Two fields directly to the north-east of the site (separated from the site by Halse Road) are currently subject to a planning application for residential development known as 'Radstone Fields Extension'.

4.8.20 The topography of the study area is a gently undulating landform with the site located on a south-west facing slope directly opposite a north-eastern facing slope. The northern end of the site is located on a higher ridge of ground at around 147m AOD, which drops to around 114m AOD at the dismantled railway and A422 to the south of the site. The landform then rises again over a distance of 800m to around 135m AOD, before falling to 120m AOD 500m further to the south-west and then rising again to 150m AOD 2km south-west of the site. Hinton-in-the-Hedges is located in the slight dip to the south-west of the first ridge south of the site.

4.8.21 This undulating topography is mirrored to the west and east of the site. To the east of the site the centre of Brackley is around 144m AOD before the landform falls to around 110m AOD along the eastern edge of the town. To the north and north-west of the site the landform broadly rises to a height of 161m AOD around the village of Halse. To the north-east the landform varies between 129m AOD and 145m AOD.

Landscape Character

4.8.22 Nationally the site is located at the very north-eastern edge of National Character Area (NCA) 107 Cotswolds and adjacent to National Character Area 91 Yardley Whittlewood Ridge. NCA 107 Cotswolds is dominated by the Cotswolds Area of Outstanding Natural Beauty (AONB), however the eastern boundary of the AONB is over 20km from the site boundary and would not be impacted by the proposals.

4.8.23 At the regional level (NCLCA) the site is located in Landscape Character Type Boulder Clay Landscapes 6. Undulating Claylands, which is further divided at a local level where the site is located within the south-west corner of Landscape Character Area 6a The Tove Catchment. Within the NCLCA the Tove Catchment Character Area is described as being, *'characterised by a combination of both arable and pasture farming with improved pasture largely located around village settlements bordering the River Tove and its tributaries, and also on sloping valley sides'*.

4.8.24 Landscape Character Area 13a Middleton Cheyney and Woodford Halse (which is part of Landscape Character Type Undulating Hills and Valleys) is located to the immediate south-west of the site. Within the NCLCA the area is described as, *'a number of prominent hills are located within the undulating landscape, including*

Hinton Hill, which can create height and a sense of elevation within the landscape. Although broad, sweeping undulations are evident, in areas the undulations become more frequent and narrow resulting in a more intimate character. Whilst views are expansive from more elevated areas of land, landform and vegetation confines views in places. Watercourses located along many undulations are visible in the landscape as lines of vegetation. The area is characterised by a combination of both arable and pastoral farmland with pasture predominating around settlement, and also frequently occurring on both steeper slopes, and gentle slopes adjacent to watercourses.'

Landscape Designations

4.8.25 The site is not host to any nationally recognised landscape designations nor any of South Northamptonshire's identified Special Landscape Areas.

4.8.26 Within the wider study area environmental designations relevant to character are limited to Gooseholm Copse ancient woodland 1km west of the site, and scheduled monuments on the Sites and Monuments Record (SMR) Brackley motte and bailey castle (1.5km south-east of the site) and Steane medieval village (2km north-west of the site). Whilst the scheduled monuments are a component of the landscape character of the study area, likely impacts on them are more appropriately assessed within the archaeology and cultural heritage chapter of the ES.

Visual Amenity

4.8.27 The study area for the visual assessment will be the same as that described for the landscape assessment, and the visual baseline (existing views and visual amenity) is informed by the landscape baseline. The visual baseline forms the basis for the identification and description of the likely visual effects. It establishes the areas from where the development may be visible, the different groups of people who may experience views of the proposed development, the locations or viewpoints where they would be affected and the nature of the views at those locations.

4.8.28 For the final EIA a zone of theoretical visibility (ZTV) model will be undertaken using digital surface model (DSM) data from Ordnance Survey, ArcMap 10.7 software and the associated Spatial Analyst extension. This software factors in earth curvature and atmospheric refraction. At this stage (scoping) a basic viewshed exercise has been undertaken using GoogleEarth software to indicate the areas from where the development is likely to be most visible.

4.8.29 The undulating topography described above in paragraphs creates a landscape where medium-to-long distance visibility can be fairly limited if the receptor is located between ridges, but expansive if the receptor is located on a ridge or other highpoint in the landscape.

4.8.30 The location of the site on a gentle south-west facing slope directly opposite a north-eastern facing slope, creates an expanse of open landscape to the south and south-west of the site with direct open views towards the site. This area extends to the higher ridge of ground approximately 800m south-west of the site. However, much of this area is farmland which is not publicly accessible except for PRoW AR4 which

connects the west of Brackley to Hinton-in-the-Hedges via Manor Farm, PRoW AR6 which extends out of the north of Hinton-in-the-Hedges to The Cabin and PRoW AR3 which connects Hinton-in-the-Hedges to Steane Park to the south-west and west of the site. Also to the west of the southern end of the site are properties and PRoW AN25 at Brackley Gorse.

4.8.31 On initial appraisal it is likely that receptors within the village of Hinton-in-the-Hedges itself would be unlikely to have views of the development, due to the village's location between ridges and the mature hedgerows in and around the village which further filter views. Prior to completion of the ES a field survey would be undertaken to ascertain whether this is the case.

4.8.32 The undulating local landform means it is unlikely that the southern half of the proposed development would be visible from elsewhere within the study area (excluding receptors directly adjacent to the site) other than the opposite facing slope.

4.8.33 The northern half of the proposed development is on higher ground and is likely to be visible from receptors around the northern edge of Brackley and potentially extending as far north as the village of Halse. As well as residential receptors around the periphery of Brackley other potential receptors include residents at Brackley Grange and Hill Farm, and users of Bridleyway VA16 (The Worlidge), PRoW VA14, PRoW VA8, PRoW AN27 and PRoW AN44, all located to the north and north-west of the site.

Viewpoints and Photography

4.8.34 To illustrate the nature and extent of the potential landscape and visual effects arising from the proposed development, a series of viewpoint locations will be selected to demonstrate the visual context of the site and study area from a range of publicly accessible vantage-points and to represent the experience of a range of visual receptors within the 2km study area. Each viewpoint will be visited and a photographic record taken.

4.8.35 As explained in GLVIA3 (para 6.19), viewpoints are selected to be either representative of the view experienced by different groups of people, to be specific to a particular location, or to be illustrative of or demonstrate a particular effect. The selection will take account of a number of factors, including:

- The accessibility to the public;
- The potential type, relative number and sensitivity of the viewers who may be affected;
- The viewing direction and distance (short, medium and long distance);
- Whether the view is static or part of a sequential view along a route;
- The view types (glimpsed, framed or panoramic); and
- The potential for cumulative views of the proposed development in conjunction with other similar developments.

4.8.36 It should be noted that the selected viewpoints are not intended to be a representative sample of all the visual receptors, but are deliberately biased to be representative of the most sensitive visual receptor groups – namely residential areas, valued landscapes or sites and important and/ or popular recreational areas.

4.8.37 No access to private land will be sought and the assessment will therefore be based on a best assumption from publicly accessible locations.

4.8.38 It is not proposed to include night-time photography from any of the viewpoint locations.

4.8.39 The viewpoints will be agreed in conjunction with planning officers at Northamptonshire County Council and other stakeholders as required. The level of visualisation such as annotated photography or photowire frames would also be agreed in advance with the local authority. All viewpoint photographs will be taken in accordance with the Landscape Institute's (LI) Technical Guidance Note 06/19 'Visual Representation of Development Proposals'.

4.8.40 Likely locations for viewpoints to be included in the EIA are listed below:

- PRoW VA19 within the site boundary and to the north-west of the site;
- Humphries Drive or similar, within the western edge of residential Brackley;
- Halse Road where it exits the north of Brackley and adjacent to the north of the site;
- PRoW AR4 to the south of the site;
- PRoW AR6 to the south-west of the site;
- PRoW AR3 to the west of the site;
- Hinton-in-the-Hedges would be visited during the field survey and a viewpoint included if appropriate;
- PRoW AN25 at Brackley Gorse to the west of the site;
- Halse Road where it meets Bridleyway VA16 (The Worlidge) to the north of the site;
- Halse Road where it meets PRoW AN44 to the north of the site; and
- Halse village would be visited during the field survey and a viewpoint included if appropriate.

Potential Impacts/Effects

Construction

4.8.41 Construction effects are generally considered to be short-term in nature. During construction activities the impact on the landscape character of the site and the surrounding area would be of a localised nature and adverse due to the disturbance caused over the short term by construction activities.

4.8.42 The likely landscape and visual impacts arising from construction are identified as:

- Temporary adverse effects due to the introduction of construction activity to the rural landscape;
- Temporary loss of visual amenity and associated loss of openness due to the introduction of construction activities;
- Typical activities with the potential to affect visual amenity include:
  - Site clearance;
  - Introduction of temporary storage facilities, site compounds and temporary parking areas;
  - Earth movement and modelling;
  - Vehicular and large plant movement on and off-site and on local roads; and
  - Night-time lighting[38] and working outside of normal working hours, particularly for works in winter.

Operation

4.8.43 The likely landscape and visual impacts arising following the completion of construction activities are identified as:

- Direct effect on landscape pattern through the permanent loss or fragmentation of important landscape components such as field pattern and potentially mature trees and hedgerows;
- Direct and indirect effects on landscape character through a change in existing land uses;
- Adverse effects associated with any potential change in the perception of scale, or urbanisation of the rural landscape through the extension of the town of Brackley;
- Introduction of a new built form into undeveloped rural fields, and associated loss of openness;
- Loss of visual amenity as associated with the loss of existing landscape features;
- Introduction of residential and street lighting into a currently unlit area[39]; and
- Long term beneficial effects associated with potential landscape enhancements as part of the mitigation scheme, such as reinforcement/ reinstatement of woodland belts and green infrastructure connectivity, and an increase in overall vegetation cover.

[38] A separate lighting assessment chapter will consider the technical detail of lighting impacts from the proposed development. The LVIA chapter will cross reference the technical lighting assessment where appropriate.
[39] See footnote 36.

4.8.44 Once construction work has been completed the proposed development is likely to be perceived as an extension of Brackley and not appear as incongruous to its setting or out of context with the wider landscape in the study area.

4.8.45 In particular the proposed development is likely to have a short or long-term impact on the landscape character and/or visual amenity of:

- The proposed site;
- Residential receptors on the western edge of Brackley;
- Residential receptors at Brackley Gorse and Brackley Grange to the west of the site;
- Residential receptors at The Cabin and Manor Farm to the south of the site; and
- Users of PRoW VA19 which crosses the site and to a lesser extent a small number of other PRoW (as detailed above) around the vicinity of the site.

Scope and Methodology of Assessment

4.8.46 It is proposed that a study area of 2km extending from the red line boundary around the proposed site would be sufficient to fully ascertain the likely environmental effects on landscape character and visual amenity arising from the proposed development. Experience on similar projects and an initial desk-based site appraisal suggests that noticeable landscape and visual effects are likely to be limited beyond this distance.

4.8.47 It is proposed that the assessment will take account of the effects of the proposed development at the following points in time:

- Construction – the point at which the construction works would be visible;
- Operation Year 1 – the point at which the proposed development would first be visible in its entirety and before mitigation planting had an opportunity to mature; and
- Operation Year 8 – once proposed mitigation planting has had the opportunity to mature.

4.8.48 The key aspects of the proposed development will be considered against the baseline conditions to allow the potential landscape and visual effects to be predicted. Consideration will be given to effects on:

- Landscape receptors, including the constituent elements of the landscape, its aesthetic or perceptual qualities and the character around the development; and
- Visual receptors or the people who could be affected by changes in views and visual amenity at different locations.

4.8.49 The term *'landscape effects'*, as defined in GLVIA3 (para 2.21), means effects on *'the landscape as a resource in its own right'*. It includes direct effects upon the fabric of the landscape (such as the addition, removal or alteration of structures, woodlands, trees or hedgerows), which may alter the character and perceived quality of the area,

or more general effects on landscape character and designated areas of landscape arising from the introduction of new man-made features. In landscapes designated or valued for their scenic or landscape quality, such changes can affect its perceived value or the purpose of the designation.

4.8.50 An assessment of visual effects deals with the effects of change and development on the composition of views available to people and their visual amenity[40]. The concern is with assessing how the surroundings of individuals or groups of people may be specifically affected by changes in the content and character of views as a result of the change or loss of existing elements of the landscape and/or introduction of new elements. In accordance with GLVIA3, the assessment will focus on public views experienced by those groups of people who are likely to be most sensitive to the effects of the proposed development. This includes local communities where views contribute to the landscape setting enjoyed by residents in the area; tourists and visitors to the area; people using recreational routes, features and attractions; and road users.

4.8.51 The effects will be identified by establishing and describing the changes resulting from the different components of the development and the predicted effects on individual landscape or visual receptors. This will take account of both the nature and sensitivity of the receptor and the nature and magnitude of the change likely to occur.

4.8.52 Landscape and visual assessments follow a standard approach:

- Establish baseline conditions against which the effects of the proposed development will be assessed. This will include consideration of how the landscape and views may change in the future irrespective of the proposed development;
- Determine the nature of the receptor likely to be affected i.e. its sensitivity. Sensitivity combines judgements about a receptor's susceptibility to change arising from a specific proposal with judgements about the receptor's relative value;
- Predict the nature or magnitude of the effect likely to occur. To consider a magnitude of effect the assessor combines judgements about the likely size and scale of the change, and the degree of integration or otherwise with the existing character and context; the geographical extent of the area over which it is likely to occur and/or be perceptible; whether it is direct or indirect; reversible or irreversible; short, medium or long term in nature; and whether the effect is positive, negative or neutral; and
- Assess whether a significant effect on the landscape or visual amenity is likely to arise by considering the predicted magnitude of change together with the

[40] GLIVA3 defines visual amenity as 'Meaning the overall pleasantness of the views people enjoy of their surroundings as they live, work, recreate, visit or travel through an area'.

sensitivity of the receptor, taking into account any identified mitigation measures; and

- assess whether or not there are any residual significant effects. Residual effects are long-term effects identified once proposed mitigation measures have been implemented.

4.8.53 Each judgement will be determined by a combination of quantitative and qualitative assessment using professional judgement accompanied by a clearly explained rationale.

Cumulative Effects

4.8.54 The different types of cumulative effect, including in-combination and inter-project cumulative effects are explained above in Section 3.2 of this Scoping Report.

4.8.55 Paragraph 7.2 of GLVIA3 identifies cumulative landscape and visual effects as those that, *'…result from additional changes to the landscape or visual amenity caused by the proposed development in conjunction with other development (associated with or separate to it), or actions that occurred in the past, present or are likely to occur in the reasonable future'.*

4.8.56 Paragraph 7.5 of GLVIA3 acknowledges that cumulative landscape assessment is complex and approaches to it are evolving, noting also that the *'challenge is to keep the task reasonable and in proportion to the nature of the project under consideration……It is always important to remember that the emphasis in EIA is on likely significant effects rather than on comprehensive cataloguing of every conceivable effect that might occur…'.*

4.8.57 The assessment of cumulative landscape effects will follow a similar methodology to that described above for the main assessment, in that the degree of effect is determined by combining an evaluation of the sensitivity of the landscape or visual receptor and the magnitude of change. The difference from the main assessment is that the cumulative assessment considers the magnitude of change which would potentially arise from multiple developments.

Preliminary discussions of mitigation and enhancement measures

4.8.58 Wherever possible the landscape mitigation strategy should aim to retain the pattern and structure created by the existing field boundaries around the periphery of, and within, the site. The hedgerows create green corridors which connect to the woodland belt adjacent to the southern boundary of the site which extends into the countryside along the route of the dismantled railway. In addition, retaining the existing field boundaries of mature hedgerows and tree belts will provide a good visual screen for nearby residential receptors of the construction works and completed development.

4.8.59 As detailed above in the project overview, the proposals seek to retain and upgrade the existing PRoW crossing the site. The PRoW will be enhanced with new

footpaths/cycle links to provide additional connectivity with the existing community. In tandem with this, the vision for the green infrastructure strategy for the site aims to create a 'green spine' along the western boundary, from which branch a series of green corridors which cross the site. These corridors will enhance the existing hedgerows on the site and will link to the existing open spaces within the adjacent residential area, providing key pedestrian/cycle movement routes which link to existing routes within Brackley. The public open spaces will include formal and informal recreation areas, surface water attenuation and structural landscaping.

4.8.60 Within the site boundary the new tree planting and landscaping around public open spaces will help to filter and soften the visual impact of the new built form, as well as enhancing green infrastructure in and around the site and aiding the integration of the development with its context over time.

4.9 Ecology and Nature Conservation

Introduction

4.9.1 This section outlines the approach that will be adopted for the assessment of the effects on designated sites, key habitats and species arising as a result of the construction and operation of the proposed development.

Relevant Policy and Guidance

4.9.2 A range of International, European, National and local legislation, policy and guidance exists to provide a framework to conserve designated sites, habitats and species. The ecology and nature conservation assessment will be undertaken with reference to the following legislation:

- Council Directive 92/43/EEC on the Conservation of natural habitats and of wild fauna and flora; referred to as the Habitats Directive;
- Council Directive 79/409/EEC on the Conservation of Wild Birds; referred as the Birds Directive;
- Conservation of Habitats and Species Regulations 2010;
- Wildlife and Countryside Act 1981 (as amended);
- Natural Environment and Rural Communities (NERC) Act 2006;
- The Hedgerow Regulations 1997;
- The Countryside and Rights of Way Act 2000; and
- The Badgers Act, 1992.

4.9.3 The assessment will be undertaken with reference to the below summarised national and local policy and guidance documents.

- The National Planning Policy Framework;
- Planning Practice Guidance: Natural Environment, Biodiversity, Ecosystems and Green Infrastructure;
- Joint Nature Conservation Committee (2003). Handbook for Phase 1 Habitat Survey: A Technique for Environmental Audit, revised reprint. JNCC, Peterborough;
- English Nature (2001) Great crested newt mitigation guidelines. English Nature, Peterborough;
- Strachan, R., Moorhouse, T. and M, Gelling. (2011). Water vole conservation handbook, Third edition, WildCRU;
- Marchant, J. H. (1983). BTO Common Birds Census Instructions. BTO, Tring;
- CIEEM, 2016. Guidelines for Ecological Impact Assessment in the UK and Ireland; Terrestrial, Freshwater and Coastal. Second Edition. Chartered Institute of Ecology and Environmental Management;

- CIEEM (2017) Guidelines for preliminary ecological appraisal;
- IEA. (1995). Guidelines for Baseline Ecological Assessment. Institute of Environmental Assessment;
- Oldham, R.S., Keeble, J., Swan, M.J.S. and Jeffcote, M. (2000). Evaluating the suitability of habitats for great crested newt (Triturus cristatus). Herpetological Journal 10 pp. 143-155;
- Amphibian and Reptile Groups of the United Kingdom: ARG UK Advice Note 5 – Great Crested Newt Habitat Suitability Index, May 2010; and
- Eaton, M., Aebischer, N., Brown, A., Hearn, R., Lock, L., Musgrove, A., Noble, D., Stroud, D., and Gregory, R, (2015). Birds of Conservation Concern 4: the population status of birds in the UK, Channel Islands and Isle of May. British Birds 108, 708-746.
- DEFRA (2007) Hedgerow Survey Handbook. A standard procedure for local surveys in the UK. Defra, London.
- Collins, J. (ed.) (2016). Bat Surveys for Professional Ecologists: Good Practice Guidelines (3rd edn.). The Bat Conservation Trust, London
- Harris, S., Cresswell, P. & Jefferies, D. (1989). Surveying Badgers. The Mammal Society
- Northamptonshire Biodiversity Action Plan, 3rd Edition 2015-2020;
- BS 5837:2012 Trees in relation to design, demolition and construction.

Preliminary Assessment of Baseline Conditions

Study Area

4.9.4 The Study Area focussed on the extent of the Application Site and immediately adjacent areas (visible from within the Application Site), with the exception of the below:

Desk Study

- Information in relation to statutorily designated sites within 1km of the Application Site was obtained.
- Information in relation to non-statutorily designated sites within 1km of the Application Site was obtained.
- Species records within 1km of the Application Site were obtained.

Field Surveys

- Great Crested Newt Habitat Suitability Index (HSI) Assessment; HSI survey of all identified water features within the site and a buffer zone of 0.25km from the Application Site.

Baseline Conditions

4.9.5 In summary, the below survey/assessments have been completed or are to be completed. All survey work completed prior to 2020 solely included the northern section of the Application Site.

- Extended Phase 1 Habitat Survey (2008)
- Preliminary Ecological Appraisal (2020)
- Bats:
  - Daytime survey to assess potential presence of bat roosts and foraging habitat suitability (2010).
  - Preliminary Roost Assessment (PRA) (buildings)/Preliminary Ground Level Assessment (PGLI) (trees) (2020).
  - Aerial inspection of Potential Roost Features identified during PGLI (2020).
  - Bat activity surveys (2010 and 2020).
- Herpetofauna:
  - Daytime survey to assess the site and immediate surrounding area for the likelihood that any herpetofauna species may be present; especially any refuges that herpetofauna species may use for shelter. An assessment of likely access routes for any Herpetofauna species to and from any potential breeding ponds or areas (2010).
  - Great Crested Newt Habitat Suitability Index (HSI) assessment (2020).
- Badger survey (2010 and 2020).
- Breeding Birds:
  - Daytime survey of the site for bird nesting sites (2010).
  - Update assessment of habitat suitability (2020).
- Hedgerow Survey (2020)
- Badger Surveys; Application site and 0.03km from Application Site boundary.
- Bat Roost Surveys; Application Site and adjacent areas where disturbance impacts could occur.

4.9.6 The following description of the Application Site baseline condition is based on the above detailed survey work and will be further added to and updated as the design develops and the full survey dataset becomes available. Surveys followed the

relevant methodologies (as applicable at the time of the survey) described within the guidance documents section within this scoping report.

Designated Sites

4.9.7 There are no statutorily designated sites within the search area and five non-statutorily designated sites; details are provided within **Table 4.4**.

Table 4.4 Designated site details

Site	Approx. distance from site centre/direction	Description
Non-Statutorily Designated Sites		
Brackley Pocket Park (PP)/ Potential Wildlife Site (PWS)	0.15km/SE	A linear pocket park along a disused railway line with a range of habitats including scrub, young woodland, swamp communities, a pond, ditch and grassland. A good habitat mosaic and although none of the habitats meet the Wildlife Site criteria in their own right, this is a good site for local wildlife and provides important connectivity through the landscape. It has been retained as a PWS.
Brackley Disused Railway (West) Local Wildlife Site (LWS)	Adjacent/South	Disused railway line including a mosaic of scrub and species rich wet and dry neutral grassland. The site qualifies as an LWS under the neutral grassland (15 indicators) and scrub criteria.
Brackley Gorse LWS	0.75km/W	A wet woodland on an area of sandy soil that has previously been recorded as supporting patches of scrub and acid grassland. The site is likely to harbour some more interesting plant species, and provides a good bird and mammal site connected to the disused railway line as well as the stream corridor.
Brackley Grange Pasture PWS	0.4km/W	A permanent pasture grazed by cattle, this was a generally species poor grassland, with a good cover of common grasses, a scattering of ruderal species and only occasional herb species. An area between the brook and main fields was fenced off to provide a riparian corridor, with ruderal species dominating this area. Two ponds have been created and fenced off, and these are starting to develop marginal vegetation, in particular the southern pond had some interesting grassland surrounding it.

Site	Approx. distance from site centre/direction	Description
Gooseholm Copse LWS	1.0km/W	An area of ancient woodland with a variety of elm among other native species. The site has diverse ground flora and supports a range of birds and mammals.

4.9.8 The site comprises a total area of c.34.2 hectares, which gently slopes towards the disused railway line in the south of the site and was dominated by arable farmland.

4.9.9 A footpath is present along the top of the railway embankment in the south of the site, this footpath is formed by closely mown grass. The embankment is densely vegetated, particularly on its southern slope. At the base of the northern bank of the railway embankment a ditch is present, which was largely dry during the site surveys (although some waterlogged sections were present).

4.9.10 Interior field boundaries within the site and around the site boundary are formed by hedgerows (predominantly Hawthorn Crataegus monogyna). The hedgerows along the eastern boundary appeared to have been planted as a boundary between the site and the playing fields and residential areas beyond. Hedges on the western and northern sides of the site appeared to be older.

4.9.11 At the interface of hedgerows and arable crops, semi-improved grassland margins are present, with a low diversity of higher plants evident and much evidence of regular use by walkers.

4.9.12 A section of the western boundary was formed by large Leyland Cypress *Cupressus × leylandii trees*

4.9.13 A small copse of mature deciduous woodland is present in the west of the site.

4.9.14 No hedgerows within the site were classified as important according to the definitions listed within the Hedgerow Regulations 1997.

4.9.15 The desk study returned records of 53 species of higher plants, all with the exception of two (Bluebell *Hyacinthoides non-scripta* and Dwarf Cherry *Prunus cerasus*) occurring before 2010.

Protected Species

Bats

4.9.16 A number of trees were identified during the PGLI around the Application Sites' periphery that possessed features (e.g. knotholes, fissures and woodpecker holes) with the potential to support roosting bats. Aerial inspection of these trees did not identify any bat roosts, and no trees with the potential to support roosting bats were identified in areas where disturbance could occur.

4.9.17 The Application Site also supports some habitats and linkages to the wider environment (i.e. ditches and hedges) which bats could use for commuting and/or foraging. Bat activity surveys completed in 2010 identified usage of the site by Common Pipistrelle *Pipistrellus pipistrellus*, Soprano *Pipistrelle P. pygmaeus*, Leisler's

Bat *Nyctalus leisleri*, Natterer's Bat *Myotis nattereri*, Whiskered/Brandt's Bat *M. mystacinus/brandtii*, and Brown Long-eared Bat *Plecotus auritus*.

4.9.18 Update surveys were completed during 2020. Preliminary assessment of the data obtained indicates that a similar assemblage of species was recorded.

Hazel Dormouse

4.9.19 No records of Hazel Dormouse were returned during the desk study, and the extent of potentially suitable habitat within the Application Site is limited. The Northamptonshire Mammal Recorder stated that there were no submitted records of Hazel Dormouse from near the site. Taking into account the limited extent of potentially suitable habitat to be impacted and the absence of desk study records from the area it is considered to be highly likely that this species is absent from within the Application Site.

Badger

4.9.20 An active Badger sett was present within the Application Site, with three holes visible. Various mammal trails were also present throughout the site, although due to the high number of dog walkers it is possible that these were caused by dogs.

4.9.21 Two records of Badger (most recently in 2017), including one of a sett, were returned from the desk study.

4.9.22 A comprehensive Badger survey will be completed in January 2021.

Other Section 41 Mammals

4.9.23 The following records of Section 41 mammals were returned during the desk study; Water Vole Arvicola amphibious (five records, most recently in 1997), Brown Hare Lepus europaeus (two records, most recently in 2018) and Otter *Lutra lutra* (one record, in 2000).

4.9.24 It is considered possible that Brown Hare could utilise the site. The regular presence of any other Section 41 species is considered highly unlikely.

Amphibians

4.9.25 No ponds are present within the site, with three ponds present within 0.25km of the site, all of which were subject to HSI assessment. Habitats between the ponds and the site comprised predominantly intensively managed arable farmland and/or housing. The assessment indicated that is unlikely that populations of GCN would occur within the site. However, further consideration of GCN (given that parts of the site fall within the Amber Zone on the District Level Licence Impact Risk Zone Map) and assessment of the potential for impacts on GCN is to be undertaken. It is noted that South Northamptonshire Council holds a District Licence GCN.

4.9.26 The desk study returned single records of Smooth Newt *Lissotriton vulgaris* (ca. 1km southeast of the site) and Common Frog *Rana temporaria* (ca. 0.15km southeast), both in 2017.

4.9.27 At this stage, it is considered highly unlikely that the Application Site supports significant numbers of any amphibian species.

Reptiles

4.9.28 The desk study returned one record of Grass Snake *Natrix helvetica* (0.02km/east in 2012). Taking into account the nature of the habitats within the site and the results of the desk study, the potential presence of any reptilian species within the Application Site is considered highly unlikely.

Birds

4.9.29 A dedicated breeding bird survey has not been completed although observations of birds were logged throughout the 2020 survey period. Low species diversity have been present within the application site during the breeding season and winter. The sole Schedule 1 (of the Wildlife & Countryside Act 1981 (as amended)) noted was Red Kite Milvus milvus, although no evidence of breeding was noted.

4.9.30 It is highly likely that the site supports a variety of foraging finches, buntings and thrushes during the winter months.

4.9.31 The desk study returned records of 15 bird species.

Invertebrates

4.9.32 The desk study returned six butterfly species and five species of moth, with only one of these records occurring since 2002.

4.9.33 Taking into account the nature of the habitats on-site it was considered unlikely that significant populations of invertebrates are present.

Invasive Plants

4.9.34 No non-native invasive plant species listed on Schedule 9 of the Wildlife & Countryside Act 1981 (as amended) were observed during the survey and no records of such species were returned during the desk study.

Potential Impacts/Effects

4.9.35 Some of the potential effects on ecology include (but are not necessarily limited to, pending further assessment):

Designated Sites

4.9.36 Direct (habitat loss) and indirect (increased visitor pressure etc) impacts to non-statutory sites.

Habitats

4.9.37 Direct loss of terrestrial habitats including hedgerows and potentially areas of woodland/trees from the footprint of the project. Indirect effects through changes in hydrology or overshadowing.

Species

4.9.38 Direct loss of bat foraging habitat (including effects of lighting).

4.9.39 Direct loss of breeding habitat for breeding bird species and / or disturbance of these breeding species.

4.9.40 Direct loss of habitat for wintering / migratory bird species.

4.9.41 Impacts to setts and direct loss of foraging habitat for Badger.

Scope and Methodology of Assessment

4.9.42 The assessment will be based on the Guidelines for Ecological Impact Assessment in the UK and Ireland Terrestrial, Freshwater and Coastal produced by the Chartered Institute of Ecology and Environmental Management (CIEEM, 2016).

4.9.43 This will document the habitats, species and sites of nature conservation interest recorded on and around the Application Site and provide an assessment of the ecological value of these within the site context. Potential impacts resulting from the construction and operation of the proposed development will be assessed and reported in terms of their significance for the integrity and conservation status of ecological receptors. For example, these will include impacts to bats resulting from habitat loss during the construction phase, and operational phase effects such as increased visitor pressures on non-statutory wildlife sites in the local area.

4.9.44 Avoidance, mitigation, compensation and/or enhancement measures will be proposed to reduce negative impacts and achieve biodiversity gains, where feasible and appropriate. The predicted residual effects of the scheme will then be quantified and consequences for decision making discussed in view of the mitigation measures proposed and the value of any ecological receptors affected.

Significance Criteria

4.9.45 The significance criteria outlined within the CIEEM guidance (and briefly summarised in the following paragraph) will be used for the assessment of effects on nature conservation.

4.9.46 A beneficial or adverse impact (reversible or permanent) will be determined to be significant or not depending upon the effect on integrity of a defined site or ecosystem(s) and/or the conservation status of a habitat or species, and whether this effect is in accordance with policy. The scale at which the significant effect matters will be determined according to the value of the receptor/resource.

Preliminary discussions of mitigation and enhancement measures

4.9.47 A detailed list of mitigation measures will be developed to avoid or reduce any significant adverse effects, for example this could include seasonal constraints on construction activities to avoid impacts on particular species at sensitive times of year (e.g. the breeding bird season).

4.9.48 Opportunities for enhancement will also be explored, including the creation of new habitats to support those found locally for the benefit of local wildlife species, for example bats and birds. Mitigation and enhancements will be considered for incorporation into the design to ensure no net loss of biodiversity, including:

- Installing a comprehensive package of bat boxes into buildings and trees;

- Providing a similar range of bird nest boxes;
- Creation of ponds;
- Creation or reptile / amphibian hibernacula;
- Planting around the boundary of the sites to enhance habitats for protected species including foraging bats, birds and amphibians; and
- Enhancement of habitats in the south of the site, associated with the Brackley Disused Railway (West) LWS.

4.10 Archaeology and Cultural Heritage

Introduction

4.10.1 The following summary has been prepared by The Environmental Dimension Partnership Ltd (EDP) to provide an initial appraisal of potential archaeological issues with respect to the site. It also identifies the appropriate scope and methodology for assessment within an EIA.

Relevant Policy and Guidance

4.10.1 The Planning *(Listed Buildings and Conservation Areas) Act 1990* is relevant in considering the potential for development to affect these categories of designated heritage assets. Specifically, in Sections 66 and 72 of the Act the local authority is required to give great weight to the desirability of preserving or enhancing listed buildings and their settings and the character and appearance of conservation areas respectively.

4.10.2 Section 16 of the National Planning Policy Framework (NPPF), sets out the government's approach to the conservation and management of the historic environment, including both designated and non-designated heritage assets, through the planning process.

4.10.3 Of relevance to planning applications is the approach to balancing the desirability of development against 'harm' to designated and non-designated heritage assets, contained in paragraphs 193 to 197. The Planning Practice Guidance provides further clarifications on heritage-related terminology used within the NPPF, as well as approaches to assessing effects on heritage assets.

4.10.4 Section 10 of the South Northamptonshire Local Plan (2020) includes local planning policies regarding heritage assets, which broadly mirror those included within the NPPF.

4.10.5 The EIA chapter would adhere to the guidance set out in the Design Manual for Roads and Bridges (Highways England, et. al. 2020), which sets out a methodology for assessing the impact on heritage assets within an EIA framework. Furthermore, a methodology for the assessment of potential indirect effects on heritage assets through changes to their 'setting' (i.e. the surroundings in which they are experienced) are laid out as a five-step process in Historic England's *The Setting of Heritage Assets: Historic Environment Good Practice Advice in Planning Note 3 (Second Edition) (2017).*

4.10.6 Further relevant guidance for assessing impacts on heritage assets are contained within Historic England's guidance documents *Conservation Area Designation, Appraisal and Management: Historic Advice Note 1 (2019) and Managing Significance in Decision-Taking in the Historic Environment: Historic Environment Good Practice Advice in Planning Note 2 (2015).*

Preliminary Assessment of Baseline Conditions

Designated Heritage Assets

4.10.7 The site does not include any designated heritage assets, as defined in Annex 2 of the NPPF, where there would be a presumption in favour of their retention.

4.10.8 The closest such asset, as shown on the plan within **Appendix D**, is the Brackley Town Conservation Area, which is located c. 985m to the east of the site. The *Conservation Area Appraisal* (south Northamptonshire Council 2012) summarises its special interest as follows:

"Brackley's special interest lies in the excellent survival of its planned medieval layout, with long narrow burgage plots stretching back from a wide central street, and in its rich stock of historic buildings. Many buildings retain 17th Century fabric behind 18th and 19th Century facades. The town's built environment is of high quality and reflects its long history as a market town."

4.10.9 Whilst an appropriate level of assessment of this asset will be undertaken in due course, it initially appears that the majority of the conservation area's special interest is contained within its constituent built fabric and layout. By comparison, the site is distant and separated from this asset by a substantial area of modern housing, which is the result of the town's incremental expansion to the north west. At the current time, it appears unlikely that the site forms part of the setting of this asset and/or contributes to its special interest.

4.10.10 The conservation area includes multiple listed buildings, such as the Grade II* listed Town Hall (List ID: 1190100) and Grade II listed Magdalen College School (List ID: 1040571). Given their location within the historic core of Brackley, as defined by the conservation area, it is likely that their setting is characterised by their location within the constituent street scenes and the wider urban environment of the settlement. Given the distance and separation from the site, it is unlikely that the site forms part of their setting and/or contributes to their significance.

4.10.11 Designated heritage assets beyond these are still further distant (in excess of 1km) from the site and it is also unlikely that the site forms part of their setting and/or contributes to their significance.

Non-Designated Heritage Assets

4.10.12 In the south of the site, the Northamptonshire Historic Environment Record (HER) records three Romano-British findspots of a coin (MNN19112) and Trumpet brooch (MNN19111), both of which were found during metal detecting (ENN4133). A possible stone scatter and associated Roman pottery sherds and 'scraper' (presumably worked flint) (MNN31374) were also found within the site, and were identified during fieldwalking (ENN4132). The HER does not substantiate the stone scatter and it appears that this may have been the result of disturbance of underlying geology through ploughing.

4.10.13 In the centre of the site, the HER records a medieval manuring scatter (MNN35609) which was identified during a pipeline development (ENN18459 – not identified on the plan). The nature of these deposits, i.e. being brought in from elsewhere, is such that this has no bearing on the archaeological potential of land within the site.

4.10.14 The HER also records the medieval open field of 'Castle Side Open Field' (MNN115752), which covers the entire site and also extends east and south-east, covering a large part of the urban area of Brackley. This relates to a 13th century open field system which was subdivided in association with the foundation of the town to create two separate systems, the dividing line being Halse Road.

4.10.15 Within the wider area around the site, the HER identifies early and mid-prehistoric evidence in the form of unstratified finds, such as a Neolithic worked flint (MNN148667) c. 500m to the south. Late prehistoric and Romano-British settlements have been identified through fieldwork investigation and aerial photograph analysis of cropmarks, such as a Middle Iron Age settlement (MNN142717) c. 220m to the north east, suggesting an intensification of the use of the landscape during this period.

4.10.16 In terms of the medieval period, the historic core of Brackley is located c. 985m to the east, and the site falls outside of any known areas of settlement. It was most likely used as farmland from at least the later medieval period onwards.

4.10.17 This information was augmented in 2020 by a geophysical survey of all available land within the site, undertaken by Magnitude surveys. This identified a concentration of possible prehistoric and/or Roman settlement activity in a localised area positioned on and immediately adjacent to high ground in the south half of the site. Additional potential archaeological remains indicating mineral and agricultural exploitation of the land were scattered across the remainder of the site.

4.10.18 Whilst there is therefore a high potential for archaeological remains in a localised part of the southern end of the site, and a moderate to low potential for the remainder of the site, given its long-term ploughing (such that is likely to have impacted on underlying remains) it appears unlikely that any remains present would be of sufficient significance or quality of preservation to warrant retention within a masterplan.

Potential Impacts/Effects

4.10.19 Given the above initial summary appraisal, it appears unlikely that the proportionate residential development of the site would have any 'significant' effects (in EIA terms) on surrounding designated heritage assets (if any effects were to accrue at all), either during the construction or operational phases.

4.10.20 In terms of non-designated heritage assets, in the worst-case scenario it is likely that any archaeological remains present would be entirely removed through the construction process. However, it is unlikely that any remains would be of high significance, such that their retention would be warranted. Mitigation for such impacts is discussed further below.

Scope and Methodology of Assessment

4.10.21 In the first instance, it is proposed to produce an archaeological and heritage desk-based assessment, drawing on information from the Northamptonshire HER, the Historic England Archive, the Northamptonshire Archives, additional online sources for aerial photographs and historic cartographic records, and the National Heritage List for England. This information would be augmented by the results of the geophysical survey of the site undertaken in 2020 and a site walkover. This report would include a heritage setting assessment, following the five-step guidance provided in Historic England's GPA3 (2017).

4.10.22 The archaeological and heritage desk-based assessment, including the geophysical survey report, would be provided alongside the ES chapter as a technical appendix. Information would be drawn from these baseline reports to inform the content of the ES chapter.

4.10.23 The ES chapter would include consideration of the nature and sensitivity of all designated and non-designated heritage assets that may be affected by the proposed development of the site, using the criteria set out in **Table 4.5**.

Table 4.5: Sensitivity of Receptor

Receptor	Sensitivity of receptor				
	Very High	**High**	**Medium**	**Low**	**Negligible**
World Heritage Site					
Scheduled Monument					
Asset of regional or county importance					
Locally important asset with cultural or educational value					
Heritage site or feature with no significant value or interest					

4.10.24 For each identified receptor, the magnitude of the predicted impact would be considered, taking into account the criteria set out in **Table 4.6**.

Table 4.6: Magnitude of Impact

No change	No change to a heritage asset's significance.
Negligible	Change to a heritage asset that hardly affects the significance of the asset.
Low	Change to a heritage asset so that it is noticeably different.
Medium	Change to a heritage asset so that it is significantly modified.
High	Change to a heritage asset so that its significance is completely altered or destroyed.

4.10.25 For all forms of heritage asset (receptor), whether designated or non-designated, the sensitivity of the receptor (see **Table 4.5**) would be considered together with

the predicted magnitude of impact (see **Table 4.6**). **Table 4.7** below would be taken into account in determining the significance of the predicted effect.

Table 4.7: Assessment of Effect Matrix

Sensitivity of Receptor	Magnitude of Impact				
	No Change	**Negligible**	**Low**	**Medium**	**High**
Negligible	Neutral	Negligible	Negligible or Minor	Negligible or Minor	Minor
Low	Neutral	Negligible	Negligible or Minor	Minor	Minor or Moderate
Medium	Neutral	Negligible or Minor	Minor	Moderate	Moderate or Major
High	Neutral	Minor	Minor or Moderate	Moderate or Major	Major or Substantial
Very High	Neutral	Minor	Moderate or Major	Major or Substantial	Substantial

4.10.26 Predicted effects would be categorised with regard to their nature (positive, negative or neutral; direct or indirect) and their permanence (long, medium or short term; temporary or permanent). The combination of sensitivity and magnitude would be undertaken with reference to the matrix in **Table 4.7**, with those effects defined as moderate, major or substantial being 'significant' in terms of the EIA Regulations. All other effects are determined to be 'not significant' (see **Table 4.7**).

4.10.27 The above tables would be used for guidance, but professional judgement would also be used in light of the known archaeological resource and in terms of identifying the levels of sensitivity, magnitude of impact and the level of effect.

Preliminary discussions of mitigation and enhancement measures

4.10.28 Given the above initial assessment, it is not expected that any designated heritage assets would be affected by the development of the site, and therefore would not require mitigation.

4.10.29 In terms of non-designated heritage assets, these could be further investigated through trial trench evaluation to confirm the efficacy of the geophysical survey. However, at the current time, there is no reason to believe that the geophysical survey has not accurately characterised the archaeological potential of the site, and the spread of remains therein. Should trial trenching be required by the local authority's archaeological advisor, it is considered that it could most appropriately be secured by condition. However, EDP are in discussions with the local authority's archaeological advisor regarding this issue.

4.10.30 Based on the current evidence, it appears likely that any archaeological remains affected by the development of the site could be mitigated through fieldwork investigation (e.g. targeted excavation), secured by condition and undertaken prior to construction within the affected parts of the site.

4.11 Transport and Access

Introduction

4.11.1 The transport chapter of the ES will consider the likely impacts on; severance, driver stress and delay, pedestrian and cyclist amenity, accidents and safety and impacts of the construction and operational phases of the proposed development. It will complement a Transport Assessment (TA) and Travel Plan (TP) that will be submitted alongside the ES as part of the planning application.

4.11.2 This section of the Scoping Report sets out the proposed methodology for the assessment of the proposed development against transportation matters. In particular, the methodology would consider the potential effects of the proposed development on the local highway network, the footway and cycleway network and the public transport network, and how these effects will be assessed.

Relevant Policy and Guidance

4.11.3 The traffic and transport impact of the proposed development will be assessed in line with national guidance contained in the National Planning Practice Guidance (NPPG), National Planning Policy Framework (NPPF), The Institute of Environmental Assessment (IEMA) Guidelines for the Environmental Assessment of Road Traffic (if necessary), Manual for Streets and Manual for Streets 2.

4.11.4 Local guidance will also be referred to as appropriate, which includes the West Northamptonshire Joint Core Strategy Local Plan (Part 1) (2014); South Northamptonshire Local Plan (Part 2) 2011-2029 (2020); Northamptonshire Transportation Plan (2012); Brackley Town Transport Strategy (2013); Northamptonshire Smarter Travel Choices Strategy (2013) and Northamptonshire Parking Standards (2016).

4.11.5 Local adopted Supplementary Planning Documents will be referred to as appropriate and these include the South Northamptonshire Design Guide and Northampton Minerals and Waste Development Framework Designing for Waste Management (2011).

4.11.6 The main trust of recent transport policy is to reduce car dependency by making walking and cycling trips easier and by encouraging public transport trips between housing, jobs, shops and services. In particular, encouragement is given to development that is designed and located to reduce average journey lengths.

Preliminary Assessment of Baseline Conditions

Traffic

4.11.7 At this stage it is considered that the traffic impact of the development location will be assessed at the following locations:

i. The A422/A43 roundabout;
ii. Poppyfields Way/ Northampton Road roundabout;

iii. Poppyfields Way/ Halse Road;

iv. Banbury Road/ Bridge Street / Market Place;

v. Halse Road (northern access point); and

vi. A422/ Banbury Road roundabout (southern access point).

vii. Banbury Road/Pavillion Way/Field View

4.11.8 Junction Classified Counts (JCC) and Automatic Traffic Count (ATC) surveys may be carried out at these locations to inform the traffic impact assessments.

4.11.9 Consideration will be given to relevant growth factors with reference to existing traffic surveys in the area.

4.11.10 As part of the assessment work, the ES Chapter would consider baseline transportation conditions including traffic flows and highway safety. It would also consider the cumulative impact arising from committed developments nearby, which will be agreed with the highway authority through scoping discussions on the Transport Assessment.

Non-motorised Users (NMU)

4.11.11 The site is located adjacent to established pedestrian routes and there is a public right of way (PRoW) that intersects the site. PROW (VA19) connects to Prices Way in the east and PROW VA6 and VA7 in the west, providing routes towards Halse.

4.11.12 The site is also located adjacent to an established bus infrastructure as there are bus stops on Pavillions Way and further stops on the High Street. It is not considered necessary to confirm baseline NMU conditions elsewhere at this stage.

Potential Impacts/Effects

4.11.13 It is proposed that there would be two principal vehicular access points to the site. One access point to north of the site onto Halse Road and from to south onto the A422. The exact location of the junctions will be confirmed once ongoing technical work has been completed.

4.11.14 The northern Halse Road junction is expected to from a new roundabout arrangement and the southern access is expected to be a modified version of the existing roundabout between Banbury Road and the A422. At this stage it is considered that the access points will be linked by a primary access avenue running from the north of the site to the south. Servicing and refuse collection is proposed to occur from the residential roads which will be designed to accommodate a standard refuse vehicle. Emergency access will be provided via the principal vehicular access.

4.11.15 The main spine road is proposed to accommodate a bus route which could potentially facilitate a circular bus service with other settlements and the town centre, which will be subject to discussions with local bs operators.

4.11.16 Pedestrian and cycle access is also proposed onto the principal vehicular access route. The proposals also seek to retain and upgrade the existing Public Right of Way

(PRoW) and will be enhanced with new footpaths and cycle links. There will also be 'green corridors' that will link to existing open spaces within the adjacent network to the east, providing key pedestrian/cycle movement routes that link to existing routes in Brackley.

4.11.17 In addition to the above, there are two further pedestrian links that could be upgraded that would connect the site to the existing pedestrian links to the east, linking with Rose Drive/Humphries Drive and Harris Close, and these would potentially be enhanced as part of the development proposals.

4.11.18 Car parking for the residential units is proposed to be provided in line with Northamptonshire Parking Standards (2016). Appropriate provision for electric charging points, cycle parking and motorcycle parking will also be included in line with guidance.

4.11.19 A Travel Plan will be provided as appropriate in accordance with Northamptonshire Smarter Travel Choices Strategy. Measures and initiatives will be proposed through an Action Plan, all to encourage sustainable travel; and that there will be a target and monitoring regime in place further to occupation.

4.11.20 A broad assessment at this stage with reference to the industry recognised TRICS database would suggest that the development proposal is likely to generate around five vehicles per minute on average (possibly up to around 350 – 400 trips in the peak periods on this basis) between 0800-0900 and 1700-1800.

4.11.21 A construction traffic management plan (possibly within a CEMP provided by the wider team) will be proposed in order to take into consideration the routing of construction vehicles associated with the proposed development, their arrival and departure times and how to mitigate their impacts.

Scope and Methodology of Assessment

4.11.22 A Transport Assessment (TA) and a Framework Travel Plan (FTP) will be prepared to accompany the planning application as required. The TA will consider the impacts of the development on the local highway network including all junction identified above, with reference to multi-modal trip forecasts, baseline traffic flows, existing highway safety and NMU infrastructure. The TA will inform the preparation of a Transport Chapter of the ES if considered necessary.

4.11.23 Institute of Environmental Management and Assessment Guidelines (IEMA) rules will be used to define threshold impacts of development traffic and therefore the scale and extent of the transport chapter work if ultimately considered necessary. On this basis, links where the traffic flows are expected to increase by more than 30%, or where HGV flows are expected to increase by more than 30% as a result of the proposed development will be considered. Links in proximity to sensitive receptors, where traffic flows are expected to increase by more than 10% as a result of the proposed development will also be considered. Sites that are considered to be sensitive receptors with reference to IEMA are Conservation Areas, schools, health facilities, community facilities and congested junctions.

4.11.24 Where the predicted increase in traffic and HGV flow is lower than these thresholds then the significance of the effects can be considered to be low or not significant, then it is considered that detailed assessment is not required.

4.11.25 Subject to what is necessary, any ES Transport Chapter would provide an assessment of the predicted impact on the local highway network by using pre-defined significance criteria for each mode of travel. Those criteria will be based on the net change in journeys as a result of the development of the site and any infrastructure improvements delivered as part of the proposals. The significance criteria would establish the magnitude of any beneficial or adverse effects the proposed development will have on the transport network.

4.11.26 Liaison will take place with highway officers at the highway authority as appropriate.

4.11.27 In summary, the following topics would be assessed for the construction and operational phases if considered necessary:

(a) Vehicular Traffic Flows;
(b) Accidents and Safety;
(c) Driver delay;
(d) Pedestrian severance;
(e) Pedestrian delay;
(f) Pedestrian amenity;
(g) Public Transport Capacities.

4.11.28 The residual impacts of the scheme, taking into account any proposed mitigation would then be assessed and confirmed.

<u>Preliminary discussions of mitigation and enhancement measures</u>

4.11.29 Appropriate mitigation measures as set out in the Institute of Environmental Management and Assessment Guidelines (IEMA) will be proposed for the construction of the Proposed Development, based on the level of risk identified by the dust assessment.

4.11.30 With regards to the completed and operational Proposed Development, many mitigation measures are embedded into the design of the scheme. If further likely significant effects are determined, where possible, mitigation measures will be proposed so that residual effects are not significant.

4.12 Noise and Vibration

Introduction

4.12.1 This chapter of the ES Scoping Report considers the potential impacts from noise and vibration, to determine the scope of the ES assessment, and to identify the criteria and methodology that will be adopted.

4.12.2 The following noise and vibration considerations are proposed to be assessed within the ES:

- Temporary noise and vibration effects during the construction phase of the Proposed Development on existing and proposed sensitive receptors;
- The suitability of the Site for the intended uses based on the prevailing noise environment including consideration of noise from events at Brackley Rugby Club; and
- Permanent noise effects once the Proposed Development is complete on existing and proposed sensitive receptors.

4.12.3 There are anticipated to be no long-term vibration effects, either as a result of existing sources of vibration affecting the Site or as a result of vibration generated by the Proposed Development affecting existing receptors. There are no significant vibration sources in the area, and the Proposed Development is not anticipated to generate any significant sources of vibration. Long-term vibration effects will not be considered in the ES.

Relevant Policy and Guidance

National Planning Policy

4.12.4 The Department for Communities and Local Government published the National Planning Policy Framework (NPPF) on 27th March 2012 and upon its publication, the majority of planning policy statements and guidance notes were withdrawn, including Planning Policy Guidance (PPG) 24 Planning and Noise, which until the emergence of the NPPF, set out the Government's position on how noise should be dealt with in the planning system. The most recent revision of the NPPF was published in June 2019.

4.12.5 The general guiding principle in the NPPF is contained in Section 15 under the heading Conserving and enhancing the natural environment. Paragraph 170 states:

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

(e)preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of soil, air, water or noise pollution or land instability. Development should, wherever possible, help to improve local environmental conditions such as air and water quality, taking into account relevant information such as river basin management plans;"

4.12.6 Planning policy on noise is contained in paragraph 180, which also appears in Section 15 of the NPPF:

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

a) mitigate and reduce to a minimum potential adverse impacts resulting from noise from new development - and avoid noise giving rise to significant adverse impacts on health and the quality of life;

b) identify and protect tranquil areas which have remained relatively undisturbed by noise and are prized for their recreational and amenity value for this reason;"

4.12.7 A footnote to the point paragraph 180(a) refers to the Explanatory Note of the Noise Policy Statement for England, which defines both "significant adverse impacts on health and quality of life" and "adverse impacts on health and quality of life".

4.12.8 The Department for Environment, Food and Rural Affairs published the Noise Policy Statement for England (NPSE) in March 2010. The explanatory note of NPSE defines the terms used in the NPPF:

"2.20 There are two established concepts from toxicology that are currently being applied to noise impacts, for example, by the World Health Organisation. They are:

NOEL – No Observed Effect Level

This is the level below which no effect can be detected. In simple terms, below this level, there is no detectable effect on health and quality of life due to the noise.

LOAEL – Lowest Observed Adverse Effect Level

This is the level above which adverse effects on health and quality of life can be detected.

2.21 Extending these concepts for the purpose of this NPSE leads to the concept of a significant observed adverse effect level.

SOAEL – Significant Observed Adverse Effect Level

This is the level above which significant adverse effects on health and quality of life occur."

4.12.9 The NPSE does not define any of these terms numerically, and at paragraph 2.22 states for the SOAEL:

"2.22 It is not possible to have a single objective noise-based measure that defines SOAEL that is applicable to all sources of noise in all situations. Consequently, the SOAEL is likely to be different for different noise sources, for different receptors and at different times. It is acknowledged that further research is required to increase our understanding of what may constitute a significant adverse impact on health and quality of life from noise. However, not having specific SOAEL values in the NPSE provides the necessary policy flexibility until further evidence and suitable guidance is available."

4.12.10 There is no local or national guidance on how the three terms should be defined numerically.

4.12.11 There are three aims in the NPSE, two of which match and expand upon the first bullet point in paragraph 180 of the NPPF, and add a third aim that relates to a wider improvement in health and quality of life (the bold text is in the NPSE):

"The first aim of the Noise Policy Statement for England

Avoid significant adverse impacts on health and quality of life from environmental, neighbour and neighbourhood noise within the context of Government policy on sustainable development.

2.23 The first aim of the NPSE states that significant adverse effects on health and quality of life should be avoided while also taking into account the guiding principles of sustainable development (paragraph 1.8).

The second aim of the Noise Policy Statement for England

Mitigate and minimise adverse impacts on health and quality of life from environmental, neighbour and neighbourhood noise within the context of Government policy on sustainable development.

2.24 The second aim of the NPSE refers to the situation where the impact lies somewhere between LOAEL and SOAEL. It requires that all reasonable steps should be taken to mitigate and minimise adverse effects on health and quality of life while also taking into account the guiding principles of sustainable development (paragraph 1.8). This does not mean that such adverse effects cannot occur.

The third aim of the Noise Policy Statement for England

Where possible, contribute to the improvement of health and quality of life through the effective management and control of environmental, neighbour and neighbourhood noise within the context of Government policy on sustainable development.

2.25 This aim seeks, where possible, positively to improve health and quality of life through the pro-active management of noise while also taking into account the guiding principles of sustainable development (paragraph 1.8), recognising that there will be opportunities for such measures to be taken and that they will deliver

potential benefits to society. The protection of quiet places and quiet times as well as the enhancement of the acoustic environment will assist with delivering this aim."

4.12.12 The most recent Government advice on how to deal with noise and vibration in the planning system, as opposed to policy, is contained in Planning Practice Guidance (PPG) on noise, titled Noise. This document sets out a number of principles in the form of questions and answers, and reinforces the guidance set out in the NPPF and the NPSE. The PPG on noise was most recently updated in July 2019.

4.12.13 The PPG sets out a number of principles in the form of questions and answers, and reinforces the guidance set out in the NPPF and the NPSE. The noise PPG notes that:

"Noise needs to be considered when new development may create additional noise and when new developments would be sensitive to the prevailing acoustic environment (including any anticipated changes to that environment from activities that are permitted but not yet commenced)."

4.12.14 The noise PPG broadly repeats the NPSE definitions of the NOEL, LOAEL and SOAEL and it provides a summary table to explain how the terms relate to each other and to typical human reactions to sound.

4.12.15 The noise PPG provides advice on how to mitigate the effects of noise, noting that there are options to reduce noise at source, to optimise site layouts, to use planning conditions, and providing insulation within affected properties.

Local Planning Policy

4.12.16 The South Northamptonshire Local Plan (Part 2) was adopted on 22nd July 2020.

4.12.17 Policy SS2 General development and design principles states:

"Planning permission will be granted where the proposed development:

f. will result in a good standard of amenity for its future occupiers in terms of privacy, sunlight, daylight, outlook, natural ventilation, noise, odour and vibration; and will not unacceptably harm the amenity of occupiers and users of neighbouring properties and the area through noise, odour, vibration, overshadowing or result in loss of privacy, sunlight daylight or outlook, unless adequate mitigation measures are proposed and secured;"

4.12.18 The *West Northamptonshire Joint Core Strategy Local Plan (Part 1),* which was adopted in December 2014, forms part of a suite of local plans in West Northamptonshire that will guide the evolution of Northampton, Daventry and South Northamptonshire in the years that lie ahead.

4.12.19 There are two relevant policies in the Joint Core Strategy. Policies S10 *Sustainable development principles, and BN9 Planning for pollution control.*

4.12.20 Policy S10 states:

"Development will:

k) minimise pollution from noise, air and run off."

4.12.21 Policy BN9 states:

"Proposals for new development which are likely to cause pollution or likely to result in exposure to sources of pollution or risks to safety will need to demonstrate that they provide opportunities to minimise and where possible reduce pollution issues that are a barrier to achieving sustainable development and healthy communities including:

e) reducing the adverse impacts of noise.

Development that is likely to cause pollution, either individually or cumulatively, will only be permitted if measures can be implemented to minimise pollution to a level which provides a high standard of protection for health and environmental quality."

4.12.22 The Local Plan and JCS policies are consistent with the aims of the NPPF and NPSE, insofar as they require the adverse effects of noise to be minimised, without specifically stating any particular standards.

4.12.23 These policies will be taken into account as part of the noise and vibration assessment.

Guidance/Best Practice

4.12.24 The following documents will be referenced in the noise and vibration assessment:

- BS5228: 2009+A1: 2014 *Code of practice for noise and vibration control on construction and open sites, for determining and assessing the impact of noise and vibration levels likely to be generated during construction of the Proposed Development;*
- BS8233: 2014 *Guidance on sound insulation and noise reduction for buildings for assessing the suitability of the Site for residential development;*
- The World Health Organisation's *Guidelines for Community Noise* for assessing the suitability of the Site for residential development
- Building Bulletin 93 *Acoustic Design of Schools – A Design Guide* for assessing the suitability of the Site for a potential primary school;
- *IEMA Guidelines for Environmental Noise Impact Assessment* (2014) for the assessment of music noise from events hosted at Brackley Rugby Club;
- Design Manual for Roads and Bridges (DMRB) LA 111 *Noise and vibration* (2020) for assessing the potential impact of development-generated road traffic;

- The *Calculation of Road Traffic Noise* (CRTN) to calculate road traffic noise levels; and
- ISO9613 - *Acoustics – Attenuation of sound during propagation outdoors – Part 2 General method of calculation* for calculating noise levels other than road traffic or construction sources.

Preliminary Assessment of Baseline Conditions

4.12.25 The noise climate at the Site is likely to be influenced by road traffic noise, primarily from the A422 and Halse Road, which border the southern and northern edges of the Site respectively.

4.12.26 Brackley Rugby Club is located adjacent to the northern end of the eastern boundary of the Site, and it is likely that noise will be generated during matches and training, and during any events hosted at the clubhouse. While noise from matches and training is not likely to be intrusive, noise from events hosted at the clubhouse may affect the Proposed Development, if those events include amplified or live music.

4.12.27 A baseline noise survey will be undertaken to establish the prevailing noise levels at and around the Site, covering both weekday and weekend periods, to capture the full range of noise levels in the area.

4.12.28 It is likely that measurements will be carried out close to the A422 and Halse Road, and close to Brackley Rugby Club if events are hosted.

4.12.29 It is recognised that any restrictions put in place by Government to control Covid-19 have the potential to alter the noise climate during the survey, and in particular, may prevent Brackley Rugby Club from hosting any events.

4.12.30 Where possible, traffic flow data will be sourced to permit calculations of road traffic noise to be carried out, to validate the survey results. If no events are hosted at Brackley Rugby Club, library data for similar events at other similar locations will be used to inform the assessment.

4.12.31 The existing noise levels at the noise-sensitive receptors closest to the Site will also be established over a typical daytime period, for use in the assessment of construction noise.

4.12.32 There are considered to be no significant sources of vibration in the area around the Site, so no vibration measurements will be undertaken.

Potential Impacts/Effects

4.12.33 This section identifies the likely impacts and effects that will be assessed in the noise and vibration chapter.

Construction Impacts and Effects

4.12.34 Noise and vibration from construction works affecting off-site sensitive receptors is possible when the works are near the Site boundaries close to sensitive receptors.

4.12.35 The nature of construction is such that short-duration high noise levels are likely at times during the works, with possible moderate to major adverse effects occurring should heavy ground engineering works be undertaken in close proximity to sensitive receptors.

4.12.36 Vibration from construction works is less likely to be perceptible as it is attenuated in the ground more effectively than noise is in air. It is possible that minor adverse effects will occur where heavy ground engineering works are undertaken in close proximity to sensitive receptors.

Occupation Impacts and Effects

4.12.37 The noise levels across the Site will be calculated, and assessed against national and local planning policy, and against relevant British Standards and guidelines. It is unlikely that significant adverse effects will occur in terms of the suitability of the Site for residential uses or a school. If such effects do occur, mitigation is available and can be incorporated into the detailed design of the Proposed Development.

4.12.38 The potential effect of noise from events at Brackley Rugby Club will be considered, either based on survey data, or on library data if there are no suitable events to measure. The assessment will consider the potential for disturbance from these events so that mitigation can be incorporated into the design of the Proposed Development to avoid placing additional constraints on the ability of the rugby club to host events. The mitigation is likely to be in the form of site layout design and building envelope specification.

4.12.39 Significant adverse impacts at sensitive receptors away from the Site as a result of development-generated traffic are unlikely, since traffic volumes on the surrounding roads would need to significantly increase. However, minor adverse impacts are possible.

4.12.40 There are anticipated to be no significant sources of vibration in the area around the Site, nor is the Proposed Development anticipated to generate any significant vibration during its long-term use. Long-term adverse effects as a result of vibration are considered unlikely.

Scope and Methodology of Assessment

4.12.41 The potential magnitudes of impacts will be determined for a range of aspects of the Proposed Development, as follows:

- a noise model will be built to calculate noise levels across the Site, based on the noise survey results. Where required, the noise survey will be validated using calculations based on available road traffic flow data for the local road network.

This may be important to consider the effect of the Government's restrictions due to Covid-19 on the measured noise levels. The noise levels calculated across the Site will be depicted on high-resolution plans, overlaid with the Proposed Development layout;

- the suitability of the Site for residential development will be assessed in accordance with national and local planning policy. Particular reference will be made to the NPPF, NPSE, PPG on Noise, and relevant British Standards/other guidance, such as BS8233: 2014 and the World Health Organisation's *Guidelines for Community Noise*;
- the potential for adverse effects from events hosted at Brackley Rugby Club will be assessed with reference to the guidance in the IEMA *Guidelines for Environmental Noise Impact Assessment;*
- the suitability of the site for a primary school will be assessed against the guidance contained in Building Bulletin 93;
- the impact of noise and vibration from construction works will be predicted and assessed in accordance with the guidance set out in BS 5228: 2009+A1: 2014; and
- changes in road traffic noise levels along roads in the vicinity of the Site will be assessed for both the construction and long-term use of the Proposed Development. The traffic noise levels will be calculated in accordance with the CRTN and the impact of any changes assessed in broad accordance with DMRB (LA111).

4.12.42 The impacts will be identified as either negligible, low, moderate or high, adverse or beneficial.

4.12.43 The sensitivity of affected receptors will be determined according to the scale set out in **Table 4.8**.

Table 4.8: Sensitivity of Receptors

Receptor Sensitivity	Type of Receptor
High	Hospitals (e.g. operating theatres or high dependency units), residential accommodation, private gardens, hospital wards, care homes, research facilities
Medium	Schools, universities, national parks, during the day; and temporary holiday accommodation at all times including hotels
Low	Offices, shops, outdoor amenity areas, canal towpaths, long distance footpaths, doctors surgeries, sports facilities and places of worship
Negligible	Warehouses, light industry, car parks, agricultural land

4.12.44 The impact magnitude will be related to the receptor sensitivity to determine the overall significance of the effect, in accordance with **Table 4.9**. An effect of moderate or major significance can be considered to be significant in EIA terms.

Table 4.9: Significance of Effect

Magnitude of Impact	Sensitivity of Receptor			
	High	**Medium**	**Low**	**Negligible**
High	Major	Moderate	Minor	None
Moderate	Moderate	Minor	Minor	None
Low	Minor	Minor	None	None
Negligible	None	None	None	None

4.12.45 Where significant adverse effects are identified, mitigation measures will be recommended to minimize the adverse effects of the Proposed Development. Any residual effects that may exist after mitigation has been applied will be identified.

Geographical Scope

4.12.46 The suitability of the Site for the Proposed Development will be assessed, geographically, within the Site boundary.

4.12.47 Direct effects from the Proposed Development on surrounding sensitive receptors, which might arise from noise or vibration generated on-site from construction activities will be assessed within an area up to approximately 500 metres from the Site boundary. However, in practice, the receptors closest to the Site will be the worst-affected, with noise and vibration levels reducing with increasing distance from the Site.

4.12.48 The assessment of off-site road traffic noise impacts will be determined by the traffic patterns away from the Site. It is likely that the assessment will consider roads within approximately 3km of the Site.

Temporal Scope

4.12.49 The assessment will consider both the short-term and medium-term effects that might result from the construction of the Site, which may occur over a period of approximately seven years, and the medium to long-term effects associated with the use of the Site once completed.

Preliminary discussions of mitigation and enhancement measures

4.12.50 Any identified significant adverse effects from the construction of the Proposed Development are likely to be mitigated through the imposition of controls during the construction works, either through a Construction Environmental Management Plan or by condition. The use of Best Practicable Means, as defined in the Control of Pollution Act 1974, is likely to form part of the measures. Such measures are likely to include:

- The appropriate selection of plant, working methods and programming; Only plant conforming with or better than relevant national or international standards, directives or recommendations on noise or vibration emissions will be used. Plant

will be maintained in good condition with regard to minimising noise output and workers exposed to harmful noise and vibration.

- The appropriate operation and maintenance of plant, having regard to the manufacturer's written recommendations or using other appropriate operation and maintenance programmes that reduce noise and vibration emissions. All vehicles and plant will be switched off when not in use, and unnecessary revving will be avoided.
- The use, where necessary, of effective sound reducing enclosures.
- The selection of routes and programming for the transport of materials and personnel to reduce the risk of increased noise and vibration impacts.
- The careful coordination of delivery times such as to avoid sensitive periods.
- The sympathetic positioning of plant and activities to minimise noise at sensitive locations.
- The training of operatives to employ appropriate techniques aimed at keeping site noise to a minimum.

4.12.51 Any identified significant adverse effects in terms of the suitability of the Site for residential uses or a primary school are likely to be resolved through the detailed design process, with appropriate siting of sensitive uses, acoustic barriers or fencing, perimeter landscaping, or the use of appropriate building materials. The exact nature of the mitigation will depend on the form of development and the magnitude of identified impacts.

4.12.52 Significant adverse effects from off-site road traffic noise are unlikely. However, in the event of such adverse effects occurring, measures such as a Travel Plan to reduce car use are typically the most appropriate mitigation.

4.13 Air Quality

Introduction

4.13.1 An air quality assessment will be undertaken, and an ES Chapter will be prepared to determine the potential effects of the Proposed Development (during demolition and construction, and once completed and operational) on air quality, and to identify the appropriate mitigation measures as necessary.

Relevant Policy and Guidance

4.13.2 The following policy and guidance documents will be considered within the air quality assessment:

- National Planning Policy Framework[41] and Planning Practice Guidance[42];
- Air Quality Strategy[43];
- Clean Air Strategy 2019[44];
- Air Quality (England) Regulations (2000)[45] and Air Quality (England) (Amendment) Regulations (2002)[46];
- EU Directive 2008/50/EC[47] and its implementation in UK law through the Air Quality Standards Regulations[48];
- National Air Quality Plan[49] (and supplement to the 2017 Plan[50]);
- Reducing Emissions from Road Transport: Road to Zero Strategy[51];
- DEFRA's Review & Assessment: Technical Guidance LAQM.TG(16)[52];
- Institute of Air Quality Management (IAQM) Guidance on the Assessment of Dust from Demolition and Construction[53];
- Environmental Protection UK (EPUK) and IAQM Land-Use Planning & Development Control: Planning for Air Quality[54];
- The Northamptonshire Transportation Plan[55];

[41] Ministry of Housing, Communities & Local Government (2019) National Planning Policy Framework.
[42] Ministry of Housing, Communities & Local Government (2019) Planning Practice Guidance.
[43] Defra (2007) The Air Quality Strategy for England, Scotland, Wales and Northern Ireland
[44] Defra (2019) Clean Air Strategy 2019.
[45] HMSO (2000) The Air Quality (England) Regulations 2000 Statutory Instrument 928.
[46] HMSO (2002) The Air Quality (England) (Amendment) Regulations 2002, Statutory Instrument 3043.
[47] The European Parliament and the Council of the European Union (2008) Directive 2008/50/EC of the European Parliament and of the Council
[48] HMSO (2010) The Air Quality Standards Regulations 2010 Statutory Instrument 1001.
[49] Defra (2017) Air quality plan for nitrogen dioxide (NO2) in the UK.
[50] Defra (2018) Supplement to the UK plan for tackling roadside nitrogen dioxide concentrations.
[51] DfT (2018) The Road to Zero: Next steps towards cleaner road transport and delivering our Industrial Strategy.
[52] DEFRA (2016) Review & Assessment: Technical Guidance LAQM.TG16.
[53] IAQM (2016) Guidance on the Assessment of Dust from Demolition and Construction v1.1.
[54] Moorcroft and Barrowcliffe et al (2017) Land-Use Planning & Development Control: Planning for Air Quality v1.2.
[55] Northamptonshire County Council (2012) Northamptonshire Transportation Plan - Fit for Purpose.

- The West Northamptonshire Joint Core Strategy[56];
- South Northamptonshire Council's Supplementary Guidance Document on Air Quality and Emissions Mitigation Guidance for Developers[57]; and
- South Northamptonshire Council's Air Quality Action Plan[58].

Preliminary Assessment of Baseline Conditions

4.13.3 South Northamptonshire Council has declared one Air Quality Management Area (AQMA) within its administrative boundary for exceedances of the annual mean nitrogen dioxide (NO_2) objective; however, this AQMA is located 15 km to the northeast of the Proposed Development site along the A5 Watling Street in Towcester.

4.13.4 The Council operates a number of passive diffusion tube monitoring sites to measure annual mean NO_2 concentrations within its administrative boundary, including two sites within close proximity to the Proposed Development (BR2 along High Street in Brackley, and BR4 at Versions Farm Bungalow in Brackley). Monitoring data for the year 2019[59] (the latest year of monitoring data available from South Northamptonshire Council) at these locations show annual mean concentrations to be well below the objective.

4.13.5 In terms of fine particulate matter (PM_{10}), South Northamptonshire Council concluded that there are no exceedances of the objectives[55].

4.13.6 The likely evolution of baseline air quality conditions will be predicted using the ADMS-Roads dispersion model, based on DEFRA predictions for future traffic emissions and background pollutant concentrations.

Potential Impacts/Effects

4.13.7 The potential air quality effects that will be considered in relation to the demolition and construction of the Proposed Development, and once the Proposed Development is completed and operational, include:

- Effects of dust and PM_{10} emissions during the demolition and construction of the Proposed Development;
- Effects of emissions from heavy duty vehicles (HDVs) during the demolition and construction of the Proposed Development;
- Effects of road traffic emissions anticipated to be generated by the completed and operational Proposed Development; and

[56] West Northamptonshire Joint Planning Unit (2014) West Northamptonshire Joint Core Strategy Local Plan (Part 1).
[57] East Midlands Air Quality Network (2019) South Northamptonshire Council Air Quality and Emissions Mitigation Guidance for Developers
[58] South Northamptonshire Council (2008) Air Quality Action Plan (Towcester No. 1).
[59] South Northamptonshire Council (2020) 2020 Air Quality Annual Status Report (ASR).

- Effects of existing sources of emissions on future residents of the completed and operational Proposed Development itself.

Demolition and Construction

4.13.8 The air quality assessment will present a list of recommended mitigation measures to be applied during demolition and construction works, based on the level of risk identified in the demolition and construction dust risk assessment. With recommended mitigation measures in place, it is expected that the residual demolition and construction dust and PM_{10} effects would be 'not significant'.

4.13.9 Relevant guidance from the IAQM**Error! Bookmark not defined.** states that *"experience of assessing the exhaust emissions from on-site plant (also known as non-road mobile machinery or NRMM) […] suggests that they are unlikely to make a significant impact on local air quality and in the vast majority of cases they will not need to be qualitatively assessed"*. Significant effects as a result of NRMM emissions can thus be discounted from the assessment. However, suitable mitigation measured for demolition and construction plant will be presented as part of the mitigation measures, based on advice included in the IAQM guidance document.

Operation

4.13.10 The overall air quality effects associated with the completed and operational Proposed Development will be determined based on predicted impacts at sensitive receptors and using professional judgment. Where possible, and if likely significant effects are determined, mitigation measures will be proposed so that residual effects are not significant.

Scope and Methodology of Assessment

4.13.11 The scope of the air quality assessment will include:

- The determination of baseline air quality conditions through examination of local monitoring data and other publicly available data;
- The identification of relevant sensitive receptor locations for the demolition and construction of the Proposed Development, and once the Proposed Development is completed and operational;
- A qualitative assessment of effects of the Proposed Development on dust soiling and concentrations of PM_{10} resulting from activities during the demolition and construction works;
- Consideration of the potential effects of emissions from HDVs during the demolition and construction period;
- A quantitative assessment of the effects of the completed and operational Proposed Development on concentrations of NO_2, PM_{10} and $PM_{2.5}$ from development-generated road traffic emissions in the proposed year of opening; and

- A quantitative assessment of concentrations of NO_2, PM_{10} and $PM_{2.5}$ that future users of the completed and operational Proposed Development will be exposed to in the year of opening.

Demolition and Construction

4.13.12 The potential effects from dust generated during the demolition and construction of the Proposed Development will be considered using the approach presented in the IAQM Guidance on the Assessment of Dust from Demolition and Construction. Cumulative effects arising from other committed developments in the study area being constructed concurrently to the demolition and construction of the Proposed Development will also be considered.

4.13.13 Demolition and construction plant emissions will not be explicitly modelled, in accordance with the IAQM guidance; however, suitable mitigation measures for demolition and construction plant will be presented, based on the advice included in the IAQM guidance.

4.13.14 The number of HDVs that will be in operation during the demolition and construction of the Proposed Development will be considered in the context of the guidance from the IAQM & EPUK. Where the number of HDVs is greater than the relevant screening criterion (25 Annual Average Daily Traffic (AADT) in an AQMA, or 100 AADT outside an AQMA) on roads with relevant exposure, then detailed dispersion modelling will be undertaken to determine worst-case effects on concentrations of NO_2, PM_{10} and $PM_{2.5}$ at existing sensitive receptor locations. Whether this is required or not will be determined once construction traffic volumes are known.

Operation

4.13.15 The ADMS-Roads dispersion model will be used to quantify the effects that road traffic emissions associated with existing and development-generated road traffic will have on air quality at existing and proposed receptor locations. The future scenarios will include road traffic associated with committed developments, thus the consideration of cumulative operational effects will be inherent to the assessment.

4.13.16 The scenarios that will be considered as part of the assessment will include, as a minimum:

- Current baseline scenario;
- Opening Year – without the Proposed Development, but with committed developments; and
- Opening Year – with the Proposed Development and committed developments.

4.13.17 As the Proposed Development will likely be occupied in phases, it is possible that the assessment of operational impacts will include interim years. This will be determined at a later stage when further information about the construction programme and phasing of the Proposed Development is available.

4.13.18 Background pollutant concentrations will be determined using data derived from the Background Maps published by DEFRA[60].

4.13.19 Meteorological data will be taken from a suitable nearby meteorological station. The year of meteorological data to be used in the dispersion model will be selected to match the latest year with available local monitoring data.

4.13.20 The baseline road model output will be verified against appropriate monitoring data from the local authority, and an adjustment factor will be determined, in line with the methodology set out in the LAQM.TG(16) guidance document.

4.13.21 The predicted concentrations will be compared with relevant air quality objectives and any exceedances will be highlighted. The overall significance of effects will be evaluated using the approach recommended by the IAQM & EPUK**Error! Bookmark not defined.**. Where possible, mitigation measures will be proposed to ensure that residual effects are not significant.

Preliminary discussions of mitigation and enhancement measures

4.13.22 Appropriate mitigation measures, as listed in the IAQM Guidance on the Assessment of Dust from Demolition and Construction**Error! Bookmark not defined.**, will be proposed for the demolition and construction of the Proposed Development, based on the level of risk identified by the dust assessment.

4.13.23 With regards to the completed and operational Proposed Development, where possible and if likely significant effects are determined, mitigation measures will be proposed so that residual effects are not significant.

[60] DEFRA (2020) Local Air Quality Management (LAQM) Support Website.

4.14 Flood Risk and Drainage

Introduction

4.14.1 The construction and operation of the Proposed Development has the potential to result in effects on Flood Risk and Drainage. This Chapter of the Scoping provides a preliminary characterisation of the baseline Flood Risk and Drainage conditions and identifies how these may alter as a result of the Proposed Development.

4.14.2 A Flood Risk Assessment (FRA) and Sustainable Drainage Statement (SDS) (inclusive of a foul and surface water drainage strategy) will form the technical appendices to the chapter, with information drawn from other relevant disciplines as appropriate.

Relevant Policy and Guidance

4.14.3 The Chapter will consider national policy and guidance including, but not limited to, the National Planning Policy Framework (NPPF), Planning Practice Guidance (PPG), Water Framework Directive (WFD) and the Flood and Water Management Act (2010). The C753 Sustainable Drainage Systems (SuDS) Manual (2015) will also be considered as part of the drainage strategy.

4.14.4 The Chapter will also consider local guidance outlined by Northamptonshire County Council as Lead Local Flood Authority. As part of the FRA for the Site, a review of the relevant local and regional policy and guidance will be undertaken, including the Strategic Flood Risk Assessment (SFRA), Preliminary Flood Risk Assessment (PFRA) and Local Flood Risk Management Strategy (LFRMS), where available. Northamptonshire County Council drainage guidance will be reviewed to inform the surface water management strategy.

Preliminary Assessment of Baseline Conditions

4.14.5 The Environment Agency (EA) Flood Map for Planning shows the site to be located wholly in Flood Zone 1, land considered to be at Low Probability of fluvial/tidal flooding.

4.14.6 The nearest Flood Zones are to the south of the Site, immediately beyond the A422, and are associated with an ordinary watercourse. This watercourse flows from west to east.

4.14.7 There is another ordinary watercourse approximately 200m west of the site, flowing in a south-westerly direction away from the site. It is not considered to pose a risk to the Site.

4.14.8 Risk of surface water flooding mapping has been prepared by the EA to show the potential flooding that could occur when rainwater does not drain away but instead lies on, or flows over, the ground. The majority of the site is shown to be at very low risk of surface water flooding. However, along the southern boundary the site is shown to be at Low to High probability of flooding. This is thought to be an inaccurate representation of pluvial flood risk with the surface water modelling method showing

water pooling behind an embankment. However, this remains subject to further investigation as part of an FRA.

4.14.9 The Site is not shown to be in the inundation zone of a reservoir failure or breach.

- Blisworth Limestone Formation (Limestone)
- White Limestone Formation (Limestone)
- Rutland Formation (Mudstone)
- Taynton Limestone Formation (Limestone, Ooidal)
- Horsehay Sand Formation (Sandstone)
- Whitby Mudstone Formation (Mudstone)

4.14.10 The EA's designation of these bedrocks varies between a Principal Aquifer, Secondary A Aquifer and Secondary B Aquifer.

4.14.11 BGS mapping shows the northern portion of the Site to be underlain by superficial deposits of either the Oadby Member (Diamicton) or Till Mid Pleistocene (Diamicton). These are designated by the EA as a Secondary (undifferentiated) Aquifer. The southern portion of the Site is shown not to be underlain by superficial deposits.

4.14.12 Anglian Water sewer records show there to be foul and surface water sewers running in parallel within the Site. These enter the boundary along the eastern edge, close to the dogleg behind existing residential properties, and cross under the A422 to the south of the Site.

4.14.13 The Site is currently greenfield in nature and therefore is not served by any positive drainage infrastructure. It is currently considered to drain via some natural infiltration into the underlying ground, supplemented by overland flow when the soil becomes saturated.

Potential Impacts/Effects

4.14.14 The Proposed Development has the potential to result in the following impacts/effects during the construction and operational phases:

- Displacement of surface water flooding, increasing flood risk elsewhere;
- Change in the rate, volume and quality of surface water runoff;
- Change in the rate, volume and quality of runoff to groundwater sources; and
- Capacity of the local foul water sewer network for receiving flows from the Proposed Development.

4.14.15 The Chapter will also consider the potential effects arising from future climate change to ensure the Proposed Development can operate safely now and in the future.

Scope and Methodology of Assessment

4.14.16 The assessment will outline the potential direct and indirect effects of the Proposed Development during both the construction and operational phases. The construction

phase of the development will be temporary; any effects will be short term. The operational phase will be permanent hence the effects will be long term.

4.14.17 The potential local receptors and pathways will be assessed based upon their sensitivity to environmental changes. The potential effects will be classified as either beneficial or adverse and the magnitude of the effects will be rated from major to negligible. Consideration will be made for elements of the Proposed Development which will result in no change.

4.14.18 The assessment will follow the methodology adopted from the Design Manual for Roads and Bridges (DMRB), Volume 11, Section 2, Part 5 (LA 104). LA113 will also be used when considering the associated highways works. The DMRB assessment methodology has been developed for the assessment of highway projects and, therefore, highway specific elements may not be utilised. This assessment will utilise three transferrable elements of the methodology. These are:

- The significance of each direct or indirect impact will be measured in accordance with **Table 14.10** which takes into consideration the quality, rarity and sensitivity of the resource to change.
- The magnitude of each direct or indirect impact according to the likely effects as detailed in **Table 14.11**. The importance of each feature should be considered.
- These two elements are then combined to establish the severity of a potential effect, as summarised in **Table 14.12**.

4.14.19 A desk-based study will be undertaken to determine the potential impacts on Flood Risk and Drainage. The study will outline the baseline conditions of the Site and any potential changes as a result of the Proposed Development.

Table 14.10: Sensitivity of Resource

Designation	Definition
High	Resource of high sensitivity to change; with a high quality and rarity on a local scale; and/or medium quality on a regional or national scale with limited potential for substitution.
Medium	Resource with a medium quality and rarity on a local scale; and/or a low quality and rarity on a regional or national scale with limited potential for substitution.
Low	Resource with a low quality and rarity, local scale and limited potential for substitution.
Negligible	Resource of little or no interest.

Table 14.11: Magnitude of Effect

Designation	Definition
Major Adverse	Results in a loss of attribute and/or quality and integrity of the attribute.
Moderate Adverse	Results in impact on integrity of the attribute, of loss of part of the attribute.
Minor Adverse	Results in some measurable change in the attribute's quality or vulnerability.
Negligible (Neutral/Not Significant)	Results in an impact on the attribute, but of insufficient magnitude to affect the use of integrity.
Minor Beneficial	Results in some beneficial impact on the attribute or a reduced risk of a negative impact occurring.
Moderate Beneficial	Results in a moderate improvement of the attribute's quality.
Major Beneficial	Results in a large improvement of the attribute's quality.

Table 14.12: Significance of Effects

		Sensitivity of Resource			
		High	**Medium**	**Low**	**Negligible**
Magnitude of Effect	**Major**	Major	Major	Moderate	Negligible
	Moderate	Major	Moderate	Minor to Moderate	Negligible
	Minor	Moderate	Minor to Moderate	Minor	Negligible
	Negligible	Negligible	Negligible	Negligible	Negligible

4.14.20 A site-specific FRA will be prepared in line with the requirements of the NPPF and associated PPG. The NPPF directs development towards areas at lowest flood risk where possible and outlines the need to prevent detriment to the wider area. The PPG includes a series of tables which define Flood Zones, vulnerability of the Proposed Development and the compatibility of the development with the defined Flood Zones.

4.14.21 The FRA will assess the flood risk posed to the Site from all sources including fluvial, tidal, groundwater, artificial (sewer, canal and reservoir) and pluvial sources. The FRA will also consider local guidance and include consultation with local flood risk stakeholders. Appropriate mitigation measures will be outlined in line with local and national guidance.

4.14.22 The SDS will consider both foul and surface water drainage. It will include an assessment of the existing surface water regime for the Site and the proposed changes as part of the development. The surface water Drainage Strategy will consider the SuDS hierarchy and SuDS principles, including appropriate measures to mitigate the impact of the Proposed Development on potential receptors. The surface water drainage strategy will consider the relevant local guidance. The statement will also consider foul water drainage arrangements.

4.14.23 To inform these supporting documents, it is proposed to undertake consultation with the EA, Northamptonshire County Council and Anglian Water.

4.14.24 To reduce impacts during the construction phase, it is expected that a Construction and Environmental Management Plan (CEMP) will be prepared for the Site at the appropriate time.

Preliminary discussions of mitigation and enhancement measures

4.14.25 The FRA will include recommendations of mitigation measures required to support the Proposed Development. It will include consideration of the potential implications of future climate change, in accordance with the relevant EA guidance.

4.14.26 It is envisaged that flood risk at the Site will be appropriately mitigated via the setting of finished floor levels, profiling of ground levels and sequential arrangement to ensure that the built development and vulnerable infrastructure is positioned outside of the areas of greatest risk.

4.14.27 The SDS will reference the proposed approach for surface and foul water drainage. It will demonstrate that the application site will continue to discharge at the equivalent greenfield runoff rate for all events up to and including the 100-year plus climate change event. The purpose of this is to replicate the existing conditions as far as possible, minimising changes to the site's hydrological regime.

4.14.28 Attenuated surface water storage should be provided at surface wherever possible. A surface water detention basin will likely feature in the proposed surface water drainage strategy, providing storage and attenuating flows, plus surface water quality benefits. Subject to their design, detention basins are known for their ability to remove sediment and buoyant materials and help with the removal of heavy metals and oxygen-demanding materials where encountered.

4.14.29 The proposed foul water strategy will be produced in consultation with Anglian Water to ensure flows from the site are appropriately treated and disposed of.

4.14.30 In addition to assessment work specific to the Flood Risk and Drainage ES Chapter, the Construction Environmental Management Plan (CEMP) will set out methodologies and monitoring requirements to prevent adverse effects.

4.14.31 Reference will be made to best practice guidance, where relevant, to minimise adverse effects.

4.15 Ground Conditions

Introduction

4.15.1 This section describes the baseline ground conditions within the Site and discusses the proposed scope of the assessment of the potential impacts of the Proposed Development on the ground.

4.15.2 This includes consideration of the potential impacts and the magnitude of such impacts the proposals will have on the soils, physical geology, land contamination, human health, quality of controlled waters, ecological systems and property.

4.15.3 The section describes the proposed method of assessment for identifying likely significant environmental effects and include considerations for mitigation and enhancement measures for such effects.

Relevant Policy and Guidance

4.15.4 The legislative framework and policies and guidance relevant to the Proposed Development are outlined below:

- West Northamptonshire Joint Core Strategy Local Plan (Part 1) December 2014
- South Northamptonshire Local Plan (Part 2) (2011-2029)
- National Planning Policy Framework (2019) Chapter 15
- Planning Practice Guidance (2016)
- The Town and Country Planning (Environmental Impact Assessment) Regulations (2017)
- Good Practice Guide for Environmental Impact Assessment (EIA) (2016)
- Part 2A of the Environmental Protection Act, 1990 as amended by the Environment Agency Act 1995
- Contaminated Land (England) (Amendment) Regulations (2012)
- Environment Agency Land Contamination: Risk Management (2019)
- Department of Food and Rural Affairs (DEFRA) – Contaminated Land Statutory Guidance (2012)
- BS10175 Investigation of Potentially Contaminated Sites – Code of Practice
- BS5930 Code of practice for ground investigations
- BS8485 Code of practice for the design of protective measures for methane and carbon dioxide ground gases for new buildings
- BS8576 Guidance on investigations for ground gas - permanent gases and volatile organic compounds
- Construction Industry Research and Information Association (CIRIA) C655 (2007)

- NHBC Guidance on Evaluation of Development Proposals on Sites Where Methane and Carbon Dioxide are Present (2007)
- NHBC Technical Extra, Issue 20, April 2016
- The Water Framework Directive (2000)
- The Water Resources Act (1991) (as amended)
- Water Environment Regulations (2017)
- The Environmental Permitting (England and Wales) Regulations (2016)
- The Control of Substances Hazardous to Human Health Regulations, 2002 (as amended) (COSHH Regulations)

4.15.5 The Ground Conditions assessment will consider the relevant local planning policies with specific reference to Policies S10, BN7A, BN8, BN9, BN10 as set out in West Northamptonshire Joint Core Strategy Local Plan (Part 1) December 2014 and Policy SS2 of the South Northamptonshire Part 2 Local Plan 2011-2029. The relevant policies are summarised below:

- S10 – sets out the sustainable development principles for new developments, promoting the minimization of pollution.
- Policy BN7A - addresses the need to protect water resources, water quality and water efficiency in relation to the design of development.
- Policy BN8 – considers the negative impact new developments can have on the environment and property through its potential to pollute and recognized opportunities for new development, particularly on previously developed land, can be constrained by existing pollution issues.
- Policy BN9 – addresses the potential for proposal to cause pollution or likely to expose sources of pollution o risk to safety, hence proposals will need to include a way to minimize and if possible reduce pollution issues.
- BN10 – covers the requirement to assess ground instability and implementation of remedial works if necessary.
- R1 – encourages the use of previously developed land and vacant and derelict sites and buildings to minimize the loss of greenfield land.
- SS2 - states planning permission will be granted for new developments if these will not adversely affect sites of nature conservation value or sites of geological, geomorphological value, is not on or in proximity of land containing known mineral resources and will not pose additional risk to users, occupiers and neighbors located in the vicinity of sites that are used for the storage, or processing or transporting of hazardous substances

Preliminary Assessment of Baseline Conditions

4.15.6 A Phase 1 Desk Study including a preliminary Conceptual Site Model (CSM) and risk assessment has been prepared to establish the baseline conditions at the Site in relation to geology, soil and mineral resources, hydrology, contaminated land and historical uses. The desk study included a precis of a ground investigation undertaken in 2010 to support a now defunct development scheme.

4.15.7 A summary of the Phase 1 Desk Study (May 2020) with the baseline conditions for the site is provided below:

4.15.8 Published Geology: British Geological Survey (BGS) mapping indicates superficial deposits are not presence across the majority of the site area, apart form the northern section, where Till, Mid Pleistocene and the Oadby Member are recorded. The underlying bedrock geology is complex and comprises of six units which are identified as, from the north to the south Blisworth Limestone Formation, White Limestone Formation, Rutland Formation, Taynton Limestone Formation, Horsehay Sand Formation and Whitby Mudstone Formation.

4.15.9 Geological Hazards: The Site and the surrounding area has negligible to low risk of ground instability hazards.

4.15.10 Radon: The Site lies within a Radon area, where 1% to 3% of the properties are above the action level. According to the Building Research Establishment (2015) no radon protection measures are necessary in the construction of new dwellings or extensions.

4.15.11 Coal Mining: According to the Coal Authority, the Site is not within a coal mining reporting area.

4.15.12 Mineral Resources: Six (6No.) surface and underground mineral workings were noted within a 500m radius, all noted as 'ceased'. The nearest records are of West Hill, a surface limestone working identified 313m and 319m to the southeast. The remaining records are of surface mineral workings for the extraction of clay and shale, sandstone and limestone.

4.15.13 Hydrogeology: The Site is underlain by a Principal Aquifers (White Limestone, Blisworth Limestone and Taynton Limestone Formations), Secondary A aquifers (Horsehay Sand Formation) and Secondary B aquifer (Rutland Formation), Secondary Undifferentiated (Superficial Deposits) and an Unproductive aquifer (Whitby Mudstone Formation). The site is not within a Groundwater Source Protection Zone. However, there are 6No groundwater abstractions within 2km of the site.

4.15.14 Hydrology: A stream / ditch runs along the southern site boundary. A small pond is located 82m south. A drainage channel runs in a southerly direction at ~76m south, converging into the Hinton Stream, at 113m southwest. The stream is a tributary of the River Great Ouse, which flows north to south at 2km east of the site. There are no records of surface water abstractions and a single discharge consent at ~400m southeast of the site.

4.15.15 Sensitive Land Use: The Site is not located within a Nitrate Vulnerable Zone, but there are records of existing Nitrate Vulnerable Zones (NVZ) within 2km of the site. These are the Anglian Great Oolite and the Great Ouse NVZ, associated with groundwater and surface water, respectively. In addition, there are Two (2No.) designated Ancient Woodlands - Gooseholm Copse and Fox Covert at 978m west and 1067m north east, respectively and a Site of Special Scientific Interest - Helmdon Disused Railway located at 1028m north east.

4.15.16 Regulatory licenses: there is one authorised discharge for unspecified effluent into land at 391m southeast and a List 2 Dangerous Substance license at 334m southeast. Two waste exemptions are noted at 262m southwest for burning waste in the open and the spreading of waste on agricultural land to confer benefit. Other exemptions have been granted within 500m of the site, for the storage of waste and sorting and denaturing of controlled drugs for disposal.

4.15.17 Current and Historical Land Use: The Site comprises predominantly greenfield land which has been in agricultural use since at least the late-1800s. A dwelling is located on the northern part of the site. The area surrounding the Site (within 250m) mainly comprises agricultural land and residential and amenity areas.

4.15.18 Previous ground investigation (2010): the investigation comprised twelve trial pits and soakaway tests. A nominal number of samples (6No) were subjected to a general contamination analysis suite and found no evidence of metal or petroleum or polyaromatic contamination within the near surface materials above their respective generic assessment criteria for land under residential use with plant uptake.

4.15.19 PCSM: Based on the desk study information and limited ground quality data, PCSM concluded that there was a potential Low to Moderate risk to human health and controlled water receptors.

Potential Impacts/Effects

4.15.20 Impacts and effects of the Proposed Development to be considered in function of sensitive receptors which could be affected (soils, groundwater bodies, human health, building or services) during the construction and operational phases.

4.15.21 Potential impacts / effects may include:

Construction Phase

- Possible physical effects on the current ground profile, instability, or other effects associated with the construction works on the site.
- Potential impacts to groundwater and surface water caused by ground disturbance associated with the construction works and potential exposure of unknown contamination.

- Potential impacts / risk to groundwater, surface water and soils associated with the introduction of new sources of contamination (such as leaks and spills) as a result of the construction works on the site.
- Health and safety risks to workers and site visitors during development works from any potential ground contamination, ground gas or other potentially hazardous materials
- Risks to new buildings, primarily foundations and services from any ground contamination or aggressive ground conditions.

Operational Phase

- Health and safety risks to future users from any potential ground / groundwater contamination and/or ground gases.
- Risks to proposed new landscaped areas from the release of any potential contamination.
- Risks to groundwater and surface water bodies from the release of any potential contamination.
- Risks to new buildings and services from ground gas generation by the underlying materials.

Scope and Methodology of Assessment

4.15.22 The assessment will commence by establishing the baseline conditions for the study site, by:

- Conducting review of the available baseline information and PCSM produced as part of the Phase 1 Environmental Desk Study, along with review of previous site investigation works.
- Developing a revised CSM and a risk assessment for the site, focusing on each phase of the Proposed Development - Construction and Operation.

Methodology of Assessment

4.15.23 The assessment methodology will comprise the following:

Physical Effects on Geology and Soil Resources

4.15.24 The assessment of the effects of the Proposed Development on physical geology and soil resources will be undertaken considering the impacts on topography, ground stability soil compaction, etc. The assessment will be undertaken using a qualitative approach, based on the baseline data and an understanding of the construction works and materials' management; including enabling and temporary works, earthworks,

proposed foundations and structures, and construction methodologies. The assessment will consider the value/sensitivity of any receptors and the magnitude of change.

Land Contamination

4.15.25 The land contamination assessment will include an updated baseline land contamination risk assessment followed by an impact assessment.

4.15.26 The revised land contamination assessment will follow a risk based approach in accordance with Environment Agency guidance 'Land Contamination: Risk Management' and CIRIA guidance C552 'Contaminated land Risk Assessment: A guide to good practice'. The level of risk will be determined using a combination of the probability and the consequence of the risk as per **Table 4.13**, below. The definitions of the magnitude of consequence and probabilities are provided in **Appendix E**.

Table 4.13 Classification of Risk by comparison of Consequence and Probability

		Consequence			
		Severe	**Medium**	**Mild**	**Minor**
Probability	**High Likelihood**	Very High	High	Moderate	Moderate/Low
	Likely	High	Moderate	Moderate/Low	Low
	Low Likelihood	Moderate	Moderate/Low	Low	Very Low
	Unlikely	Moderate/Low	Low	Very Low	Very Low
	No linkage	No risk			

4.15.27 The impact assessment will be undertaken by comparing the baseline risk assessment with the construction and operational phases risk assessment and identifying any change in impacts. For the construction and operational phases, it will consider potential impacts from new sources of contamination.

4.15.28 This assessment approach allows effects to be identified as either beneficial or adverse. The significance of identified effects is then determined based on the sensitivity of the receptor and the magnitude of potential impact (change).

4.15.29 Following the classification of an effect, a clear statement will be made as to whether the effect is 'significant' or 'not significant'. For ground conditions, High and Moderate effects will be classed as 'Significant' and 'Minor' and 'Negligible' effects not significant.

4.15.30 The tables outlining the assessment criteria that will be used to define significance of effect are included in **Appendix E** of this document.

Preliminary discussions of mitigation and enhancement measures

4.15.31 Mitigation measures will be adopted to reduce any significant effects identified from the Proposed Development in relation to physical effects and effects associated with ground contamination and soil re-use.

4.15.32 Some of the mitigation measures likely to be adopted as part of the detailed design of site development will potentially include:

- Further assessment of the ground conditions underlying the site by conducting a supplementary ground investigation, where required.
- Preparation of an interpretative report and revised contaminated land risk assessment to confirm the likely risks from ground contamination and to enable implementation any remedial measures (if necessary).
- Gas membranes to protect new buildings from ground gas intrusions.
- Provision and Implementation of a Remediation Strategy.
- Foundations options and design values for the varying ground conditions across the area.
- Input into the Drainage strategy / SUDs design based on ground conditions, potential contamination which may be found on site and infiltration values.
- Implementation of Health and safety measures and use of Personal Protective Equipment (PPE) for the protection of construction workers during the construction phase.
- Preparation and Implementation of a DoE Materials Management Plan (MMP) and verification report in accordance with the CL: AIRE Code of Practice current at the time of the works. The MMP will be produced using the information from the ground investigation and include any remedial measures (if needed).
- Preparation of a Construction Environmental Management Plan (CEMP) to manage impacts during construction works including stockpile management, implementation of working methods to manage groundwater and surface water, implementation of dust suppression measures and management of unidentified / unknown contamination that may be encountered during the works.
- Preparation and Implementation of a site waste management plan (SWMP) to provide a detailed assessment of the suitability of soils for re-use and the appropriate destination for waste, if required.

4.16 Lighting

Introduction

4.16.1 This section has been prepared by Designs for Lighting Ltd; a specialist exterior lighting consultancy with knowledge and experience in lighting impact assessments and mitigation.

4.16.2 A Lighting Impact Assessment of the Proposed Development will be undertaken in accordance with the Institution of Lighting Professional's (ILP) Professional Lighting Guide 04 – Guidance for Undertaking environmental Lighting Impact Assessments (PLG04) and will be provided as a chapter within the EIA. This chapter sets out the scope of the EIA chapter.

4.16.3 The Lighting Impact Assessment will analyse the baseline lighting conditions in the environment surrounding and including the Application Site and will provide a detailed assessment of the potential effects associated with any proposed lighting required for the Proposed Development.

Relevant Policy and Guidance

4.16.4 This section sets out the most relevant legislation, policy and guidance concerning lighting associated with the Proposed Development.

Environmental Protection Act 1990 / Clean Neighbourhoods and Environment Act 2005

4.16.5 Since 2006, artificial light is incorporated as a potential statutory nuisance in the Environmental Protection Act 1990 (as amended by section 102 of the Clean neighbourhoods and Environment Act 2005). Section 79 of the Environmental Protection Act 1990 (as amended) states:

"Artificial light emitted from premises so as to be prejudicial to health and nuisance constitutes a 'Statutory Nuisance' …and it shall be the duty of every local authority to cause its area to be inspected from time to time to detect any statutory nuisances which ought to be dealt with under section 80 below or sections 80 and 80A below and, where a complaint of statutory nuisance is made to it by a person living within its area, to take such steps as are reasonably practicable to investigate the complaint".

National Planning Policy Framework: 2019

4.16.6 The National Planning Policy Framework (NPPF) sets out the government's planning policies for England and how they are expected to be applied and provides a framework for local plans. With regards to light pollution, the NPPF was updated in November 2019 and states that the following elements are to be considered:

"Planning policies and decisions should also ensure that new development is appropriate for its location taking into account the likely effects (including cumulative

effects) of pollution on health, living conditions and the natural environment, as well as the potential sensitivity of the site or the wider area to impacts that could arise from the development. In doing so they should:

- *a) mitigate and reduce to a minimum potential adverse impacts resulting from noise from new development – and avoid noise giving rise to significant adverse impacts on health and the quality of life;*
- *b) identify and protect tranquil areas which have remained relatively undisturbed by noise and are prized for their recreational and amenity value for this reason; and*
- *c) limit the impact of light pollution from artificial light on local amenity, intrinsically dark landscapes and nature conservation."*

British Standard: BS 5489 -1 :2020 – Code of practice for the design of road lighting, British Standards Institute and British Standard: BS EN 12464 – 2:2014 – Lighting of work places (Part 2: Outdoor work places)

4.16.7 The above mentioned British Standards are applicable to the artificial lighting of the OMSSD project to ensure that lighting is implemented in accordance with best practice, whilst achieving the minimum recommended performance requirements. The British Standards also help to ensure that lighting is appropriately designed and fit for the task for which artificial lighting is required.

ILP: Guidance for Undertaking Environmental Lighting Impact Assessments (PLG04: 2013)

4.16.8 This industry standard guidance outlines good practice for undertaking assessments of the potential impact of artificial environmental lighting. The guidance outlines the procedures and considerations relevant to assessing potential environmental lighting impacts. PLG04 is applicable to the OMSSD project as an assessment of the lighting is required to be undertaken in accordance with good practice.

ILP: Guidance Notes for the Reduction of Obtrusive Light (GN01/20)

4.16.9 This guidance notes aim to reduce the potential for obtrusive light to occur, caused by poorly designed and installed exterior artificial lighting. The lighting strategy for the OMSSD project will be informed by the most relevant sections of GN01/20 (2020) to reduce the potential for obtrusive light from a wide range of exterior lighting applications.

Bat Conservation Trust and ILP: Bats and Artificial Lighting in the UK (GN08/18)

4.16.10 Guidance in relation to the potential for artificial lighting to effect bats outlines key mitigation measures regarding the lighting performance. This guidance will be considered and applied if the ecology assessment highlights the potential for artificial light at night to impact bats.

Relevant local policies

4.16.11 The most applicable policies for the development relating specifically to well-designed or thoroughly considered lighting are:

South Northamptonshire Council – South Northamptonshire Part 2 Local Plan 2011-2029 (Adopted July 2020) – Policy SS2: General Development and Design Principles

4.16.12 Relevant sections of Policy SS2: General Development and Design Principles state:

"1. Planning permission will be granted where the Proposed Development:…

1e. incorporates sensitive lighting schemes that respects the surrounding area and reduce harmful impacts on wildlife and neighbours; and…

1p. shows a detailed consideration of ecological impacts, wildlife mitigation and the creation, restoration and enhancement of wildlife corridors to preserve and enhance biodiversity;…"

South Northamptonshire Council – Design Guide Chapter 4.12. Light Pollution

4.16.13 Relevant sections of Chapter 4.12. Light Pollution state:

"Where planning permission is required for an external lighting scheme or where external lighting is required as part of a development proposal, planning applications will normally only be favourably considered where;

- ***The lighting scheme should not exceed that which is required for the satisfactory undertaking of the task involved; and***
- ***Glare and spillage is minimised through good design, particularly in areas of open countryside, on the edge of settlements, adjacent to highways or in other environmentally sensitive settings; and***
- ***Illuminance is appropriate to the surroundings and character of the area as a whole; and***
- ***The lighting is positioned to minimise the impact on the surroundings; and***
- ***There is no significant adverse impact on the local community or environment."***

Preliminary Assessment of Baseline Conditions

4.16.14 The desktop assessment of baseline conditions helps to inform the appropriate Environmental Zone classification. Environmental Zone limits are defined by the Commission Internationale de l'Eclairage (CIE: 150 :2017). The purpose of the Environmental Zones is to limit the potential for obtrusive light to occur, relative to

the district brightness of the area in which the lighting is to be implemented. The Environmental Zone descriptions are provided in **Table 4.14**.

Table 4.14 Environmental Zone Descriptions

Zone	Surrounding	Lighting Environment	Examples
E0	Protected	Dark (SQM 20.5 +)	Astronomical observable dark skies, UNESCO starlight reserves, IDA Dark Sky Parks
E1	Natural	Intrinsically dark (SQM 20 to 20.5)	Relatively uninhabited rural areas, National Parks, Areas of Outstanding Natural Beauty etc
E2	Rural	Low district brightness (SQM ~ 15 to 20)	Sparsely inhabited rural areas, Village or relatively dark outer suburban locations
E3	Suburban	Medium district brightness	Well inhabited rural and urban settlements, Small town centres or suburban locations
E4	Urban	High district brightness	Town / City centres with high levels of night time activity

4.16.15 The desktop assessment also aims to determine the locations of nearby potentially sensitive receptors, and the sensitivity of these receptors to the proposed lighting. Sensitivity and significance criteria are detailed in **Tables 4.15 - 4.18** below.

4.16.16 Potentially sensitive receptors at this stage are identified as;

- Residents of West Brackley, particularly residents of properties on Johnson Avenue, Pether Avenue, Smart's Close, Harris Close, Rose Drive, Prices Way, Brewin Close, Heron Drive, Falcon Way, and Swan Close;
- Users of Brackley Rugby Union Football Club;
- Residents of Brackley Grange Farm;
- Residents of Brackley Gorse Farm;
- Motorists using the A422; and
- Users of existing footpaths and public rights of way that immediately border or run through the Application Site.

4.16.17 There is no existing lighting within the boundaries of the Application Site and although there is lighting of the nearby existing residential settlements, the likely relevant Environmental Zone is considered E2.

4.16.18 Adjacent to the Application Site, extensive street lighting is present on residential roads to the east / southeast. Amenity lighting associated with residential properties is also present. Limited floodlighting is present on Brackley Grange and Brackley Gorse Farms; and column mounted floodlighting is present at Brackley Rugby Union Football Club.

4.16.19 The Application Site directly abuts Brackley, a developed area which is broadly lit throughout. The Application Site sits approximately 10.5 km from the built up town of Banbury, 14 km from Bicester, 12 km from Buckingham, and 15 km from Towcester. Further afield, the Application Site sits approximately 24 km from the conurbation of Milton Keynes, and approximately 27 km from Northampton.

4.16.20 Light spill from nearby developments will increase the potential for lighting levels present on the Application Site.

4.16.21 Sky glow from nearby developments, and from built up settlements in the surrounding area, will also increase lighting levels within the general surrounding area.

Potential Impacts/Effects

4.16.22 The Proposed Development requires lighting for the purposes of safety, security, and amenity in the hours of darkness. The introduction of artificial lighting creates the potential for spill light onto adjacent potentially sensitive receptors, if the effects of lighting are not mitigated, or lighting is not designed sensitively.

4.16.23 Lighting required to support the construction phase of the Proposed Development has the potential to impact nearby residential receptors through obtrusive light. All efforts will be made to minimise obtrusive light potential from construction lighting, through compliance with the key standards and guidance. If construction is to take place during the hours of darkness, lighting will comply with *BS EN 12464-2: 2014*.

4.16.24 Where possible, the luminaires will be focussed into the site to limit the possibility of obtrusive light occurring and use focused task lighting as required by the construction task being undertaken. Lighting in use within the construction phase will be required for the purposes of health and safety of the construction workforce, but all measures will be implemented through the lighting strategy to minimise its potential significance.

4.16.25 Lighting required to support the operational phase of the Application Site has the potential to impact nearby residential receptors through glare and light spill if an appropriate strategy to mitigate the effects is not implemented. This is most likely to occur from luminaires required for street lighting and amenity lighting.

4.16.26 Although lighting is a necessary component of the Proposed Development, there will be a lighting strategy that seeks to minimise the potential impacts by ensuring that lighting is deployed sensitively. It is likely that any new lighting will be characteristically similar to existing lighting in use in adjacent residential streets, and throughout Brackley.

Scope and Methodology of Assessment

4.16.27 The approach and methodology for the assessment will be in accordance with best practice guidance from the ILP PLG 04 document 'Guidance on Undertaking Environmental Lighting Impact Assessments' (2013).

4.16.28 The assessment will comprise of desktop and on-site surveys to establish he baseline lighting conditions, which will be undertaken by suitably qualified and competent lighting professionals, holding either an Associate Member (AMILP) or Member (MILP) grade of membership with the ILP. Furthermore, they will be professionally registered with the Engineering Council, holding either Engineering Technician (EngTech), Incorporated Engineer (IEng) or Chartered Engineer (CEng) status on the Engineering Council register.

4.16.29 A desktop assessment of the baseline conditions at the Application Site will be undertaken to determine the existing lighting levels on and surrounding the site. The lighting impact assessment will consider the magnitude of the change in light levels and the sensitivity of potential receptor locations to the effects of lighting as a result of the Proposed Development.

4.16.30 The baseline survey will consist of a desk-top and site-based survey of the Application Site, where baseline illuminance will be measured at potentially sensitive receptor locations.

4.16.31 Baseline illuminance measurements will be undertaken using an industry standard light meter, with valid calibration certificate, operated by a competent lighting professional. Measurement locations will be recorded using a Global Positioning System (GPS) device.

4.16.32 Following the on-site surveys, baseline survey data will be analysed and compared against the lighting proposed as part of the Proposed Development, the Environmental Zone will be classified through supporting information gathered during the baseline survey, To quantify the likely changes in light levels, industry standard lighting software will be used to model the artificial lighting associated with the Application Site, allowing calculated predictions of any potential increase or decrease in baseline light levels at sensitive receptor locations.

4.16.33 The significance of an effect from artificial lighting will be based upon the sensitivity of the receptor and the magnitude of change at that receptor due to the altered conditions. The sensitivity of the receptor will be classified as High, medium, or Low according to the descriptions provided in **Table 4.15**.

Table 4.15 Criteria for receptor sensitivity

Sensitivity	Description of Criteria
High	The environment is fragile, and an impact is likely to leave it in an altered state from which recovery would be difficult or impossible. Human (Amenity) – receptors which are sensitive to a change in lighting such that the quality of life would be affected (i.e. lighting is designated a statutory nuisance) Human (Safety) receptors where a change in the lighting has the potential to either dramatically improve or reduce safety (for pedestrians, drivers or workers). Ecological – where a change in the lighting affects the habitats, breeding or feeding of fauna (e.g. protected habitats or other special areas) or growth patterns of fauna/crops.
Medium	The environment has a degree of adaptability and resilience and is likely to accommodate the changes caused by an impact, although there may still be some residual modification as a result. Human (Amenity) – receptors which are sensitive to a change in lighting however not such that the quality of life would be affected. Human (Safety) receptors where a change in the lighting has the potential to either improve or reduce safety (for pedestrians, drivers or workers). Ecological – where a change in the lighting affects the movement or feeding patterns of fauna but the receptor can adapt.
Low	The environment is adaptable and is resilient to change. Nearly all impacts can be absorbed within it without modifying the baseline conditions. Human (Amenity) – receptors which would not noticeably be aware of a change in lighting. (i.e. in areas of medium to high luminance). Human (Safety) receptors where a change in the lighting has limited potential to affect safety (for pedestrians, drivers or workers). Ecological – area with limited wildlife.
Negligible	Receptor has little or no night-time activity

4.7.33 The magnitude of change will be determined as High, Medium, Low or Negligible in accordance with **Table 4.16**.

Table 4.16: Criteria for magnitude of change

Magnitude of Change	Description of Criteria
High	A large change compared with the natural variations in background levels. A clear breach of limits and standards may occur. For example, levels of obtrusive light in the form of sky glow, light trespass or glare towards a receptor which exceeds the limits set within the ILP guidance for a higher Environmental Zone might classify as a high magnitude of change.
Medium	Change which is noticeable and may be a breach of limits and standards. In terms of the limits set in the ILP guidance this might equate to exceeding the Environmental Zone limits but within the limits set for the next Environmental Zone
Low	Change which, when compared to background levels, is only just noticeable.
Negligible	Change which is not noticeable.

4.7.34 The significance of the change will be derived through the matrix as shown in **Table 4.17,** matching the sensitivity of the receptor, with the magnitude of the change.

Table 4.17: Significance matrix

Magnitude of Change	Sensitivity of Receptor			
	High	**Medium**	**Low**	**Negligible**
High	Major	Moderate – Major	Minor – Moderate	Negligible
Medium	Moderate – Major	Moderate	Minor	Negligible
Low	Minor – Moderate	Minor	Negligible – Minor	Negligible
Negligible	Negligible	Negligible	Negligible	Negligible

4.7.35 The significance criteria will be derived from the combination of the relevant receptor sensitivity and the magnitude of change which that receptor will experience as an effect from the lighting of the Application Site. These significance criteria are explained further in **Table 4.18** and can be either beneficial or adverse effects.

Table 4.18: Significance of effect

Significance Criteria	Description of effect
Major beneficial	Substantial reduction in obtrusive light at sensitive receptors and/or users of the Proposed Development such that large scale improvements to visual amenity, human safety or health is delivered. Significantly improves ecological habitats.
Moderate beneficial	Moderate reduction in obtrusive light at sensitive receptors and/or users of the Proposed Development such that noticeable improvements to visual amenity, human safety or health are delivered. Improves ecological habitats.
Minor beneficial	Minor reduction in obtrusive light at sensitive receptors and/or users of the Proposed Development such that perceptible improvements to visual amenity, human safety or health is delivered. Perceptible improvement to ecological habitats.
Neutral/not significant	No appreciable effect on sensitive receptors. Effects are reversible.
Minor adverse	Minor increase in obtrusive light at sensitive receptors and/or users of the Proposed Development such as an increase in Glare, Light Trespass to properties, increase in Sky Glow or effects on flora and fauna. Effects are reversible or temporary.
Moderate adverse	Moderate increase in obtrusive light at sensitive receptors and / or users of the Proposed Development such as an increase in glare, light trespass to properties, increase in sky glow or effects on flora and fauna. Requires monitoring and local remedial work. For example, lighting which is visible and causes nuisance to a sensitive receptor outside the OMSSD project site.
Major adverse	Major increase in obtrusive light at sensitive receptors and / or users of the Proposed Development such as an increase in glare, light trespass to properties, increase in sky glow or effects on flora and fauna. Requires extensive remedial works. For example, a floodlighting installation which directs light into the eyes of oncoming motorists causing disability glare and potential reduction in visual performance leading to an increased risk of collision.

4.16.34 For the purpose of the Proposed Development, it is proposed that impacts that are of moderate or major significance are taken to be significant in EIA terms.

4.16.35 The lighting assessment will consider the significance of residual impacts arising from the Application Site during the site preparation, construction, and operational phases of the Proposed Development.

Preliminary discussions of mitigation and enhancement measures

4.16.36 The lighting strategy will be developed in line with the relevant guidance and Environmental Zone criteria to ensure the potential impacts both on residential and ecological receptors are minimised.

4.16.37 Throughout the assessment process, mitigation measures will be specified as necessary to minimise the impacts of artificial lighting associated with the Application Site.

4.16.38 To ensure the potential for obtrusive light is suitably minimised, a lighting strategy will be developed to mitigate significant environmental effects.

4.16.39 A lighting strategy will ensure that the initial lighting design is suitable for its intended purpose, is unlikely to give rise to significant levels of obtrusive light and will ensure the lighting design remains compliant following scheduled or unscheduled maintenance.

4.16.40 Relevant British Standards will inform the lighting strategy along with industry standard obtrusive light guidance (Guidance Notes for the Reduction of Obtrusive Light – PLG GN01:2020).

4.16.41 Within the lighting strategy, the following mitigation measures will be considered where necessary and practicable:

- Luminaire peak beam when installed will not exceed 70° from the horizontal (refers to the main beam angle of the light emitted from the luminaire;
- Luminaires will be specified with a 0% ULOR (Upward Light Output Ratio) that emit no light above the horizontal when mounted at 0° (Unless otherwise specified by South Northamptonshire Council);
- Residential Amenity lighting will be sensitively switched through the utilisation of time clocks and PIR sensors; and
- Where there is scope within the relevant adopting authority lighting specification, luminaires will be appropriately dimmed and switched during the hours of darkness where street lighting is least used.

4.17 Summary Chapter and Non-Technical Summary

4.17.1 A chapter summarising each of the above disciplines findings will be presented. A separate Non-Technical Summary will also be provided in accordance with the EIA Regulations.

5. Topics proposed to be scoped out and not included within the Environmental Statement

5.1 Agricultural Land

5.1.1 An Agricultural Land Classification (ALC) survey of the Application Site was undertaken in September 2020 by Land Research Associates. This survey identified the Site having a mixture of shallow soils over limestone and slowly permeable soils over mudstone or glacial till, giving subgrade 3a and subgrade 3b quality land limited by droughtiness or wetness. The report is included at **Appendix F,** however in summary the below grades/subgrades were found:

Table 5.1 ALC of the Application Site

Grade/Subgrade	Area (ha)	% of the Land
Subgrade 3a	6.3	18
Subgrade 3b	26.2	77
Other land	1.6	5
Total	34.1	100

5.1.2 The National Planning Policy Framework in paragraphs 170 and 171 requires that the economic and other benefits of the best and most versatile agricultural land be taken into consideration. Where significant development of agricultural land is considered to be necessary, poorer quality should be used in preference. The best and most versatile agricultural land is defined as that in Grades 1, 2 and 3a.

5.1.3 Given the Site comprises 77% Subgrade 3b, which is poorer quality land in the context of the policy advice in the NPPF and does not fall within the BMV category, it is reasonable to conclude that the loss of this land, in relation to agricultural resources, is not significant in EIA terms.

5.1.4 Furthermore, it is generally accepted that the loss of less than 20ha of BMV agricultural land or the loss of any quantity of non-BMV land (Grades 3b, 4 and 5) is a 'low' magnitude effect. Combined with the 'moderate' quality of the Grade 3b soils, this is considered to be a minor adverse impact, as demonstrated by the widely accepted matrix below. In EIA terms, this is not considered a significant effect.

Table 5.2 Significance Matrix

Magnitude	Sensitivity		
	High	**Medium**	**Low**
High	Major Adverse / Beneficial	Moderate Adverse / Beneficial	Minor Adverse / Beneficial
Medium	Moderate Adverse / Beneficial	Minor Adverse / Beneficial	Minor Adverse / Beneficial
Low	Minor Adverse / Beneficial	Minor Adverse / Beneficial	Minor Adverse / Beneficial
Negligible	Negligible	Negligible	Negligible

5.1.5 For these reasons it is proposed that Agricultural Resources can be scoped out of the ES.

5.2 Climate Change

Introduction

5.2.1 Climate change is anticipated to lead to increasing annual temperatures, decreasing summer rainfall and increasing winter rainfall. The effects of climate change are as a result of increasing global Greenhouse Gas (GHG) Emissions.

5.2.2 The Proposed Development will lead to a change in the Site's operational GHG emissions and the design will need to include measures to adapt to the effects of climate change.

Identification of Effects which are Not Significant

5.2.3 The following identified effects are not considered to be significant. They will not be considered further with the EIA or reported in the ES. A factual evidence base has been provided below to support this based on information from the following information on climate change and guidance using professional judgement.

- The UK Climate Projections (UKCP18) which sets out the likely effects of climate change.
- UK Climate Change Risk Assessment (2017) which identifies potential climate change effects and receptors.
- IEMA EIA guide to Climate Change Resilience and Adaptation (2020).
- IEMA EIA guide to Assessing Greenhouse Gas Emissions and Evaluating their Significance (2017).

5.2.4 As necessary key mitigation will be incorporated into the development description and set out as part of a Sustainability Statement which will accompany the Proposed Development application.

5.2.5 **GHG Emissions -** GHG emissions will be emitted through the construction and operation of the Proposed Scheme. The greatest impact is likely to be from the construction stage of the development, construction emissions can account for over 50% of a developments lifetime emissions. To mitigate the impact of GHG emissions the following measures are proposed:

- A Life Cycle Assessment will be carried out to assess and reduce the construction stage emissions of the development.
- Homes will be designed in accordance with the Building Regulations. The Future Homes Standard and interim carbon targets will gradually reduce the carbon emissions of homes.

5.2.6 The UK carbon budget, while aiming to restrict GHG emissions includes an allowance for growth and development and the total GHG emissions from the Proposed Scheme when contextualised against the UK Carbon Budget and Local Authority emissions are unlikely to be significant.

5.2.7 Therefore, effects GHG emissions are unlikely to be considered significant and will not be considered within the ES.

5.2.8 **Increasing temperatures could reduce the need for heating reducing energy use and GHG emissions from development -** A reduction in heating demand in buildings will be a long term benefit in reduced GHG emissions. Therefore, this effect is unlikely to be considered significant and will not be considered further within the EIA or reported in the ES.

5.2.9 **Increasing summer mean and daily maximum temperatures may lead to health and safety risks for construction employees -** The Construction Environmental Management Plan (CEMP) which will be prepared to support the construction of the Proposed Scheme will set out climate change adaptation and measures to reduce risks to human health from overheating such as provision of shaded refuges and potable water supplies. Therefore, this effect is unlikely to be considered significant and will not be considered further within the EIA or reported in the ES.

5.2.10 **Changing annual temperatures and rainfall patterns may lead to a reduction of water supply and increasing risk of site flooding which may impact on site construction activities, increase the potential for construction site flooding and damage, and potential harm to nearby water courses. -** The CEMP will set out climate change adaptation and measures to reduce water use during construction, this will include; the monitoring and setting of targets for water reduction; protection of the site from increased risk of flooding, during construction compounds will include raised levels and appropriate temporary drainage; protection of the Site and wider area from an increased risk of flooding and potential pollution effects appropriate drainage and pollution prevention systems will be provided.

5.2.11 Therefore, this effect is unlikely to be considered significant and will not be considered further within the EIA or reported in the ES.

5.2.12 **Changes to future climate including higher winter and summer temperatures and a decrease in summer rainfall could impact site habitats and species** - Changes to the future UK climate including temperatures and rainfall may impact on site habitats and species affecting both retained and new green infrastructure. The England Biodiversity Strategy[61] sets out guidance on tackling the impacts of climate change through the use of climate tolerant species and enhancing site biodiversity.

5.2.13 The development will be looking to achieve nett gain in biodiversity utilising species/habitats known to be present in the local area, where possible making use of climate tolerant species. Therefore, this effect is unlikely to be considered significant and will not be considered further within the EIA or reported in the ES.

5.2.14 **Increasing winter rainfall could increase the risk of surface water flooding** - Increasing winter rainfall has the potential to increase the risk of surface water

[61] England Biodiversity Strategy, https://www.gov.uk/government/publications/biodiversity-2020-a-strategy-for-england-s-wildlife-and-ecosystem-services

flooding. In accordance with national guidance, which includes requirements on the consideration of climate change, the Flood Risk Assessment (FRA) and Sustainable Drainage Strategy (SDS) will consider the potential effects arising from future climate change in accordance with the latest Environment Agency guidance to ensure the Proposed Development can operate safely now and in the future. Given the site's location, Flood Zone 1 designation and proposed residential use, it is envisaged that the 'central' allowance for the '2080s' will be applied in the FRA, which equates to a 25% increase in peak river flows. Within the SDS, for the sizing of the attenuated surface water storage, it is expected that the 'upper end' allowance for the '2080s' will be applied, a 40% uplift in peak rainfall intensities.

5.2.15 Therefore, this effect is unlikely to be considered significant and will not be considered further within the EIA or reported in the ES.

5.2.16 **Changing annual temperatures and rainfall has the potential to change ground conditions and potentially damaging building and infrastructure foundations and structures. -** Building foundations will be designed and constructed in accordance with national guidance including the Building Regulations which include a requirement for foundations to be designed to take into account ground movement.

5.2.17 Therefore, this effect is unlikely to be considered significant and will not be considered further within the EIA or reported in the ES.

5.2.18 **Higher average summer mean and daily maximum temperatures may lead to building overheating, adversely affecting the health and well-being of occupants.** – To reduce the risk of overheating homes likely to be at risk of overheating will undergo thermal dynamic modelling (or via updated guidance set out in the Building Regulations) to assess the potential overheating risk taking into account future climate scenarios. Where necessary measures will be put in place to reduce the risk of overheating in accordance with the cooling hierarchy.

5.2.19 Therefore, this effect is unlikely to be considered significant and will not be considered further within the EIA or reported in the ES.

5.2.20 **Increasing summer temperatures may lead to an increase in cooling requirements, increasing energy use and GHG emissions -** By adopting the cooling hierarchy as part of the building overheating mitigation described above, and utilising passive measures to reduce the risk of overheating, the reliance on active cooling systems such as air conditioning and associated energy use and GHG emissions will be minimised.

5.2.21 Therefore, this effect is unlikely to be considered significant and will not be considered further within the EIA or reported in the ES.

5.2.22 **Decreasing summer rainfall could result in a reduced water availability affecting the operation -** In order to promote operational water efficiency, homes will target a water efficiency standard of 110l/p/d.

5.2.23 Therefore, this effect is unlikely to be considered significant and will not be considered further within the EIA or reported in the ES.

5.3 Wind climate

5.3.1 It is not considered the Proposed Development would result in significant effects on human receptors in relation to wind micro climate. The Application Site is located in a predominantly undeveloped area, and there are therefore no existing tall buildings which may create trapped vortices/wind tunnelling, nor are there many existing human receptors that could be adversely affected by the proposed built form and any potential changes in micro climate. The Lawson Criteria is the most common set of guidelines used when considering the potential effect of wind microclimate, and considers different pedestrian activities. It is the intended that the design of the buildings will seek to reduce any potential impacts as a result of wind.

5.3.2 Given the location of the Application Site, and the design of the buildings, it is considered appropriate that wind microclimate is scoped out of the EIA and resultant ES.

5.4 Daylight, Sunlight, Overshadowing and Glare

5.4.1 The Application Site is located in a predominantly undeveloped area, and there are no residential buildings or other sensitive uses close enough such that the proposed built form on the Site could cause significant changes to daylight, sunlight or cause overshadowing. The design of the development will also seek to reduce any excessive shadowing, by the consideration of roof treatments. The materials used for the buildings will also seek to reduce unnecessary glare. Given this, it is not considered that these issues are required to be considered within the ES.

5.5 Electronic Interference

5.5.1 It is not considered that the Proposed Development would cause electronic interference and therefore this is proposed to be scoped out of the EIA and resultant EIA.

5.6 Material Assets

5.6.1 Material assets in EIA is a very broad term which considers both physical and non-physical sectors that could be said to have material value. On review of the Application Site's location and context, it is not considered there are any further 'material assets' to those already addressed within other EIA topics, and therefore no further consideration of material assets is proposed within the EIA and resultant ES.

6. Structure of the Environmental Statement (ES)

6.1.1 The ES will report the findings of the EIA and will address the requirements of Schedule 4 of the EIA Regulations, as set out in section 4.

6.1.2 The ES is anticipated to include 3 volumes:

- Volume 1: Environmental Statement Main Text: sets out the findings to each of the environmental disciplines, including accompanying Figures (i.e. plans/drawings)
- Volume 2: Accompanying Technical Appendices: supports the main assessments within Volume 1; and
- Volume 3: Transport Assessment
- Non-Technical Summary (NTS) would also be provided as a separate document

6.1.3 The anticipated structure and content of Volume 1 (and Volume 2 where applicable) of the ES is likely to be as follows:

- Chapter 1 Introduction
- Chapter 2 Assessment Scope and Methodology
- Chapter 3 The Application Site
- Chapter 4 Proposed Development and Alternatives
- Chapter 5 Planning Policy
- Chapter 6 Socio Economics Issues
- Chapter 7 Landscape and Visual
- Chapter 8 Ecology and Nature Conservation
- Chapter 9 Lighting
- Chapter 10 Archaeology and Cultural Heritage
- Chapter 11 Transport and Access
- Chapter 12 Noise and Vibration
- Chapter 13 Air Quality
- Chapter 14 Flood Risk and Drainage
- Chapter 15 Ground Conditions
- Chapter 16 Summary
- Chapter 17 Glossary / References

6.1.4 Within each of the assessment chapters the main structure of the information presented, although not exclusively, will be as per the following headings:

- Introduction
- Assessment Approach (including methodology, assessment of significance, legislative and policy framework, scoping criteria, limitation)

- Baseline Conditions
- Assessment of Likely Significant Effects (Assessment of Impacts, including construction and operation)
- Mitigation, Enhancement and Residual Effects
- Cumulative and in-combination effects
- Summary

7. Environmental Statement Scoping Summary

7.1.1 This Environmental Impact Assessment (EIA) Scoping Report has been prepared on behalf of Ashfield Land Developments Ltd & Vulpes Land (the "Applicant") in respect of land at west of Brackley (the "Application Site") which is proposed for residential led development (the "Proposed Development").

7.1.2 This Scoping Report has been prepared to accompany a formal EIA Scoping Request to South Northamptonshire Council under Regulation 15 of the Town and Country Planning (EIA) Regulations 2017 (as amended) and has set out the proposed scope of the EIA and resultant Environmental Statement (ES) which is anticipated to support a forthcoming planning application.

7.1.3 From the initial assessments undertaken to date and as outlined and justified within this Scoping Report, it is proposed the ES will consider the topics listed in **Table 7.1**.

Table 7.1 Summary of Proposed ES Scope

EIA Topic	Scoped In / Out	Where Addressed within ES
Population	Scoped in	To be assessed within the Socio Economic and Human Health chapter
Human Health	Scoped in	To be assessed within various chapters as follows: Socio Economic and Human Health, Air Quality, Landscape and Visual and Transport
Biodiversity (e.g. flora and fauna)	Scoped in	To be assessed within the Ecology and Nature Conservation chapter
Land (e.g. land take)	Scoped in	To be assessed within the Landscape and Visual, Ecology and Ground Conditions Chapters.
Soil	Scoped in	To be assessed within the Ground Conditions Chapter (agricultural land is proposed to be scoped out)
Water	Scoped in	To be assessed within the Flood Risk and Drainage, and Ecology and Nature Conservation chapters
Air	Scoped in	To be assessed within the Air Quality chapter
Climate	Scoped in/out	Climate to be assessed within various chapters as follows: Air Quality, Ecology, and Flood Risk and Drainage. It is not considered that there will be a significant impact in relation to 'climate change' in EIA terms. It is therefore not proposed to include a specific chapter regarding climate change mitigation and adaptation
Material Assets	Scoped out	It is not considered there are any further 'material assets' to those already addressed within other EIA topics that may result in further significant effects
Cultural Heritage (Architectural & Archaeological aspects)	Scoped in	To be assessed within the Archaeology and Heritage Chapter
Landscape	Scoped in	To be assessed in the Landscape and Visual chapter
Interrelationship between above factors	Scoped in	Within each topic chapter

7.1.4 The Applicants look forward to receiving the Local Planning Authorities Scoping Opinion within 5 weeks, as set out within Regulation 15 of the EIA Regulations 2017 (as amended).