Appendix 3.2

EIA Scoping Report

Quod

EIA Scoping Report

North Hemel Hempstead

March 2025

Q240503

Contents

1 Introduction

1.1 The purpose of this report is to inform a request for an Environmental Impact Assessment (EIA) Scoping Opinion from the St Albans City and District Council ('SADC') in relation to emerging proposals for a residential-led development at North Hemel Hempstead. The proposals for North Hemel Hempstead are being promoted by Pigeon (Hemel Hempstead) Ltd and Bloor Homes. The Scoping Opinion is therefore being sought on behalf of Pigeon (Hemel Hempstead) Ltd and Bloor Homes (the 'Applicant').

1.2 This document does not form or support a planning application for the proposed development. It provides supporting information to allow SADC to adopt an EIA Scoping Opinion in relation to emerging proposals for development which will be subject to an outline planning application (with details of access reserved) in due course.

1.3 The site ('Site') comprises approximately 152 hectares (ha) to the north east of Hemel Hempstead. Figures 1.1 and 1.2 show the Site's location and the likely maximum extent. This may be amended through the ongoing pre-application and development process, however any changes are expected to be reductions in Site boundary to that illustrated and considered in this report. By considering the maximum likely Site extent at this stage, the scoping process for potential topic assessments to be considered in the ES would not be altered should it change.

The Project

1.4 The Applicant intends to submit an outline planning application with all matters reserved for future approval, apart from the principal access junctions to the B487 Hemel Hempstead Road and Holtsmere End Lane. The proposals will be being developed in consultation with key stakeholders and public engagement and in line with Draft SADC Local Plan[1] Policy H1 - North Hemel Hempstead Broad Location, and other relevant policies.

1.5 The application is expected to comprise a residential-led mixed use development with up to 1,500 residential dwellings (including specialist accommodation for older people)), a 3-form entry (3FE) primary school, mixed-use local centre, mobility hub, open space, amenity space, allotments, green infrastructure, sustainable drainage systems, vehicular and active travel routes and supporting infrastructure. The proposals are referred to as the 'Development'.

1.6 Brief descriptions of the Site and the Development are provided within Chapters 2 and 3 respectively.

Purpose of this Report

1.7 The Applicant has voluntarily commissioned an EIA process to inform the emerging development proposals and an Environmental Statement (ES) will therefore accompany the future planning application. EIA is a systematic process that identifies and assesses the

[1] SADC, (2024). Draft Local Plan 2041 - Regulation 19 Publication. September 2024.

environmental impacts of a development and ensures that a local planning authority, when deciding whether to grant planning permission, does so in the full knowledge of the likely significant effects on the environment. The EIA process is also used to inform the design by identifying measures to prevent, reduce or offset adverse environmental effects and enhance beneficial effects.

1.8 This report sets out the findings of a scoping study which represents the first stage of the EIA process. It accompanies a request for a Scoping Opinion submitted to SADC in accordance with Regulation 15 of The Town and Country Planning (Environmental Impact Assessment) Regulations 2017[2] (as amended[3]) ('EIA Regulations').

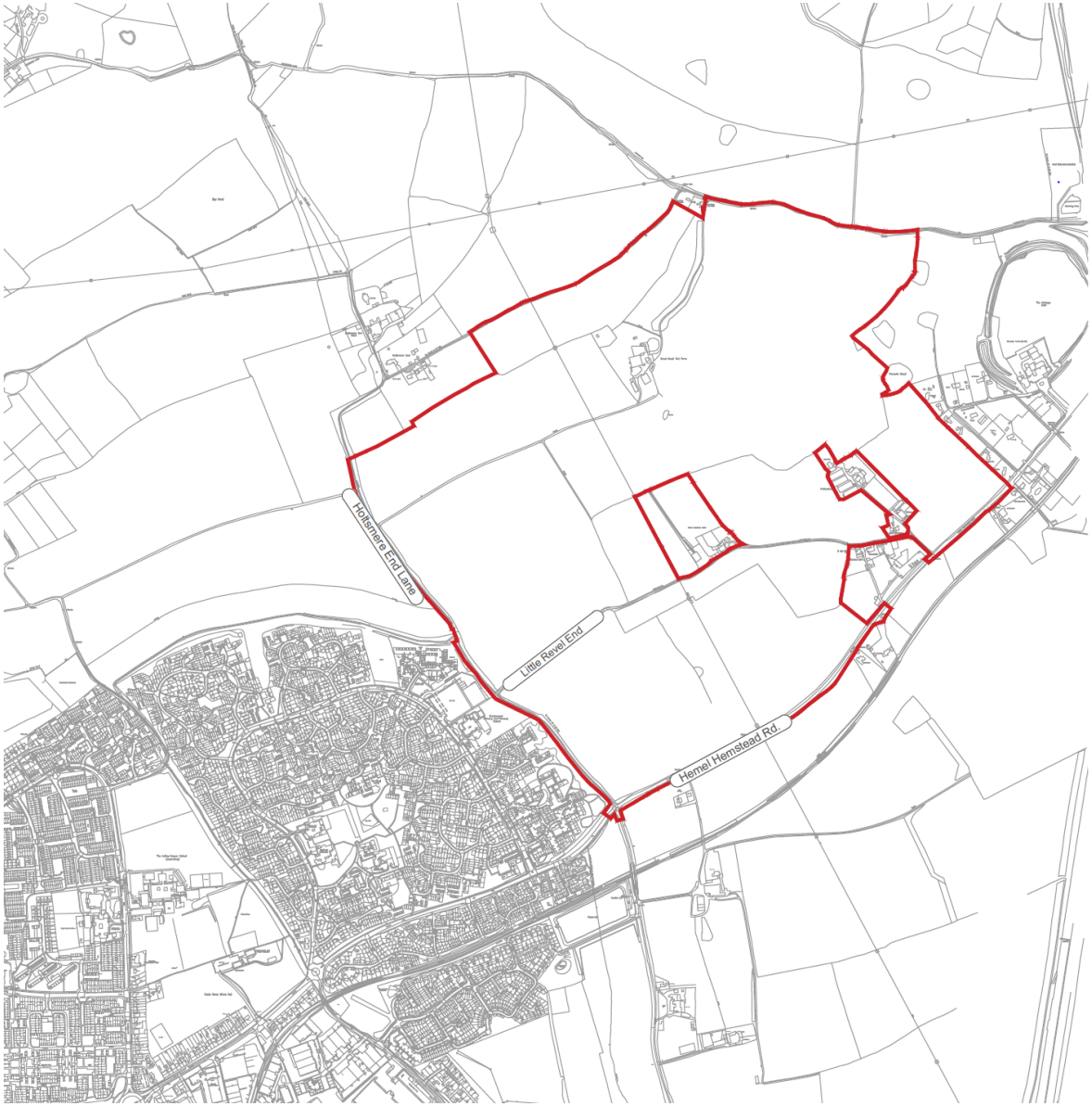
1.9 In line with the EIA Regulations, this report identifies the Site location, provides a brief description of the nature and purpose of the Development, and an explanation of the likely significant effects of the Development on the environment. The report also outlines the proposed content, approach and scope of the ES to be submitted with the planning application.

1.10 The ES will be 'based on' the Scoping Opinion to be adopted by SADC. The ES will be prepared by competent experts (see Project Team section for further details).

[2] Her Majesty's Stationary Office (HMSO), 2017. The Town and Country Planning (Environmental Impact Assessment) Regulations 2017. The Stationary Office. May 2017.
[3] HMSO, 2018. The Town and Country Planning and Infrastructure Planning (Environmental Impact Assessment) (Amendment) Regulations 2018. The Stationary Office. October 2018.

Figure 1.1: Site Location

Figure 1.2: Indicative Site Boundary



Planning Context

Local Plan

1.11 The Applicant has been promoting the Site through the Local Plan process for a number of years. The Site is identified as a 'Broad Location' for development in the emerging SADC Local Plan (Regulation 19 SADC Draft Local Plan[4]) which was submitted to the Secretary of State for Independent Examination on 29 November 2024. Broad Locations are identified as large urban extensions of 250 homes or strategic scale employment. This area lies in the Green Belt based on the adopted SADC Local Plan (adopted 1994) but is proposed to be removed from the Green Belt in the draft SADC Local Plan.

1.12 The Site is referred to as Site H1 – North Hemel Hempstead Broad Location and is identified in the Draft SADC Local Plan to provide a major urban extension of Hemel Hempstead that delivers approximately 1,500 dwellings. Site H1 is also identified as being able to provide a range of other uses including supporting uses, including specialist accommodation for older people, 3FE primary school, green infrastructure, childcare facilities and other community infrastructure. The Site H1 policy states the development will be required to deliver strategic and local public open space, high-quality transport network, and a significant publicly accessible area of green space.

1.13 Environmental information and evidence base used to inform the Draft SADC Local Plan has informed the EIA Scoping study.

1.14 The current, adopted SADC Local Plan is the District Local Plan Review 1994 and policies listed in the List of Saved Policies[5]. Any policies not on the List of Saved Policies have expired and no longer form part of the development plan. The Site was not identified as a site allocation the Adopted Local Plan.

Hemel Garden Communities (HGC)

1.15 North Hemel Hempstead forms part of the Hemel Garden Communities (HGC) Growth Area. The HGC Growth Area includes land within Dacorum Borough Council (DBC) and SADC and will provide 11,000 new homes and 10,000 jobs. Within SADC, the HGC Programme plans to deliver at least 4,300 new homes by 2041, and 5,500 homes in total by 2050, through a network of new garden communities to the north east and east of Hemel Hempstead.

1.16 The Hemel Garden Communities Framework Plan was prepared to test and inform the emerging policies for the Growth Area within each authority's draft local plans during the Regulation 19 stage. SADC submitted its draft Local Plan for examination on Friday 29th November 2024.

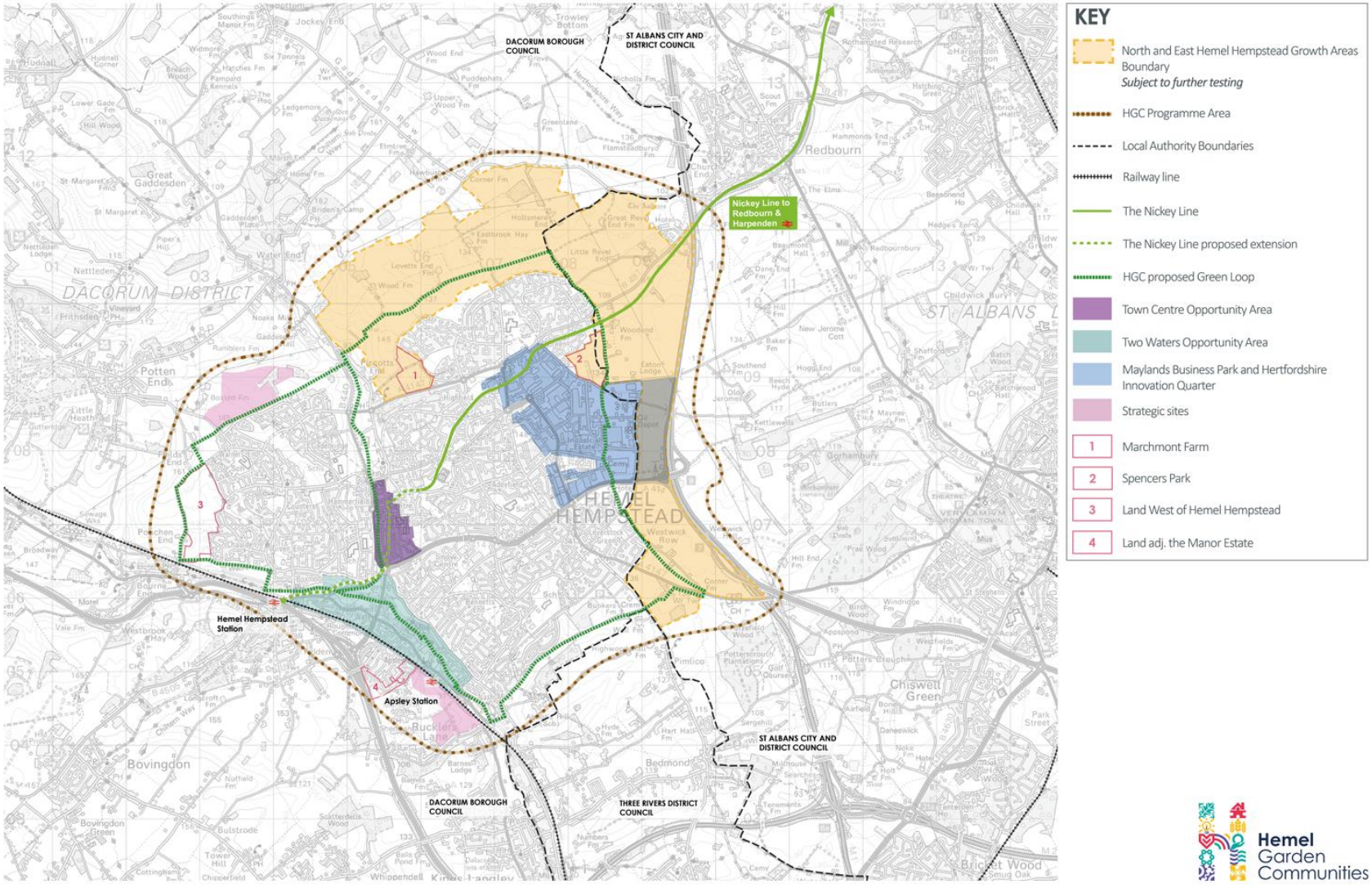
1.17 HGC, SADC and DBC are now in the process of preparing a HGC Framework and Transformation Plan SPD and a Stewardship & Placemaking SPD that will build upon the HGC Framework Plan. These emerging SPDs are being prepared alongside the Local Plan

[4] SADC, 2024. Regulation 19 Draft Local Plan 2041. September 2024.
[5] SADC, 2020. City and District of St Albans District Local Plan Review 1994. Saved and Deleted Policies Version. July 2020.

examinations and it is expected that the SPD's will be adopted by SADC alongside the adoption of the Local Plan. Figure 1.3 shows the HGC Programme Area and Concept Framework Plan.

1.18 Policy LG2 of the Draft SADC Local Plan requires all development in the HGC Programme Area to follow a planned and coordinated approach to growth and infrastructure. Development is expected to be in accordance with Local Plan Infrastructure Delivery Plans (IDPs), SADC Local Plan Policies, the emerging HGC Framework and Transformation Plan SPD, and the emerging Stewardship & Placemaking SPD.

Figure 1.3: Hemel Garden Communities Programme Area and Concept Framework Plan



Project Team

1.19 This Scoping Report has been prepared by competent experts from the organisations listed in Table 1.1. These specialists will also undertake the EIA and their relevant expertise and qualifications will be stated within the ES.

Table 1.1: EIA Project Team

Organisation	Role
Bloor Homes & Pigeon Hemel Hempstead Ltd	Applicants
Quod	Planning, EIA Co-ordination, Socio-economics and Human Health
Mosaic	Architect
FPCR	Biodiversity, Landscape and Visual Impact Assessment
i-Transport	Transport and Access
Professional Consult	Noise and Vibration
Redmore Environmental	Air Quality
RPS-Tetratech	Water Resources, Flood Risk and Drainage
Kernon Countryside Consultants	Agricultural Land and Soil
Savills Earth	Climate Change
RPS	Cultural Heritage (Built Heritage and Archaeology)

1.20 Quod will be the lead editor of the ES and author of non-technical chapters. Quod is a member of the Institute of Environmental Management and Assessment (IEMA) EIA Quality Mark Scheme, an accreditation scheme which sets high standards for EIA practice and demonstrates a commitment to excellence in EIA activities.

2 Site and Setting

Site Location and Description

2.1 Figures 1.1 and 1.2 show the Site's location and likely maximum extent of the planning application. The Site is located between the eastern urban edge of Hemel Hempstead and the village of Redbourn, approximately 4 km north east of Hemel Hempstead's town centre. The Site lies immediately east and south of the administrative boundary of DBC.

2.2 Figure 2.1 shows an aerial view of the Site. Figure 2.2 shows the key features within and around the Site.

2.3 The Site extends to approximately 152 hectares (ha) of predominantly agricultural land mainly in arable use with areas of pasture, interspersed with mature trees and hedgerow boundaries.

2.4 The topography of the Site slopes towards the north with an elevation of approximately 120m above ordnance datum (mAOD) where Hemel Hempstead Road meets Holtsmere End Lane. The northern portion of the Site lies at approximately 130mAOD.

2.5 The Site is in close proximity to strategic routes and benefits from direct linkages via the B487 Hemel Hempstead Road to the A5183 Dunstable Road and the M1 motorway to the east.

2.6 The northern and eastern Site boundaries are formed largely by Holtsmere End Lane (a single carriageway rural lane). Gaddesdon Lane forms part of the north-western Site boundary and the B487 Hemel Hempstead Road forms the southern boundary. Little Revel End, a single carriageway rural lane serving a small number of residential properties, divides the centre of the Site east to west.

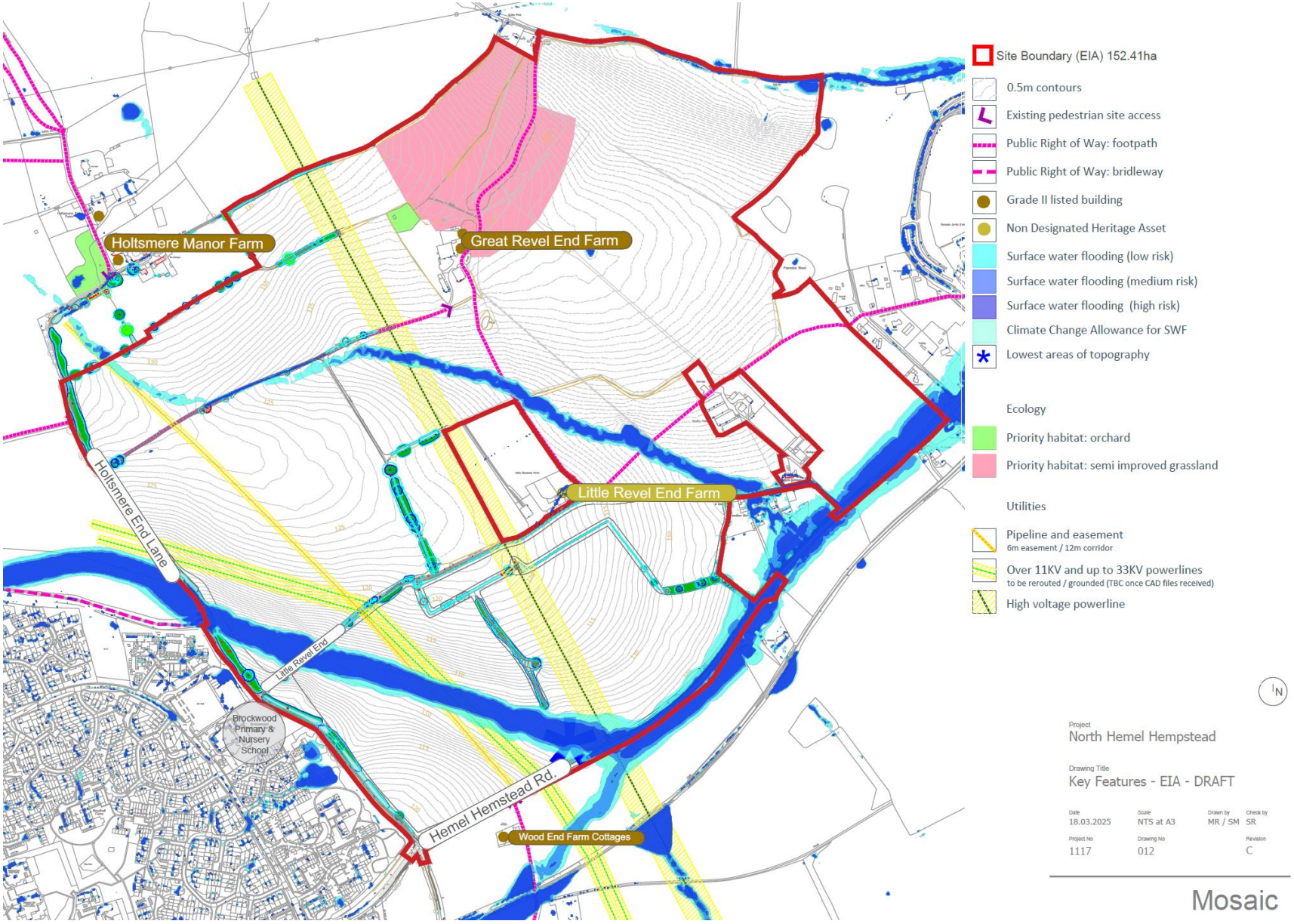
2.7 Built form within the Site includes a farmhouse and associated farm buildings associated with Great Revel End Farm in the north of the Site which is accessed from Holtsmere End Lane. Two Grade II listed buildings are associated with Great Revel End Farm: a Barn and Great Revel End Farmhouse.

2.8 A number of Public Rights of Way (Redbourn 009, 010 and 011) cross the Site as shown on Figure 2.2.

2.9 An overhead ultra-high voltage electricity pylon route crosses the centre of the Site on a north to south alignment. Diversion of this primary distribution network will not be possible and its retention forms part of the Development with appropriate easements. A pair of overhead HV services also cross the Site, skirting the existing residential development of Woodhall Farm. A high-pressure British Pipeline Agency (BPA) oil fuel pipeline crosses the Site diagonally from north-west to south-east with associated easements. The pipeline and overhead lines are shown on Figure 2.2.

Figure 2.1: Site Aerial View

Figure 2.3: Site Key Features



Surrounding Land Use

2.10 Approximately 4 ha of land including residential properties and associated gardens on Little Revel End are excluded from the centre of the Site, as shown on Figure 1.2. Other surrounding land uses include:

- **Predominantly Residential:** Woodhall Farm residential neighbourhood is located to the west of the Site, including Woodhall Farm Medical Centre, Sainsbury's supermarket and Brockwood Primary School. There are also a small number of properties on Little Revel End, Gaddesdon Lane and Holtsmere End Lane located adjacent to the Site boundary. Tullochside Farm, adjacent to the eastern Site boundary, includes a dwelling, gypsy and traveller site with caravans and other buildings. Spencer's Park residential development is under construction to the south west of the Site.
- **Agricultural** – Land to the north, east and south of the Site are predominantly in agricultural arable use. Land to the south is included within the East Hemel Hempstead (North) Broad Location.
- **Other** - A kennels, cattery and business units are located at Little Revel End Farm.

Environmental Sensitivities

2.11 Figure 2.3 identifies key environmental sensitivities within 1km of the Site. Figure 2.2 also identifies environmental constraints and features within the Site boundary.

2.12 The Site is not subject to any landscape designations. It is proposed to be removed from the Green Belt in the Draft SADC Local Plan. The southern edge of the Chilterns National Landscape (NL)[6] is approximately 830m north of the Site.

2.13 The Aubreys Camp Scheduled Monument is located approximately c.250m to the north-east, below the Site in the bottom of a valley. This is a defensive enclosure likely dating to the Iron Age. There is no clear intervisibility between the Site and the Scheduled Monument, which is surrounded by dense planting.

2.14 A number of Grade II listed buildings are located outside the Site boundary as shown on Figure 2.1 including the Grade II listed Holtsmere Manor and Grade II listed Wood End Cottages. Redbourn Conservation Area is located approximately 720m north east of the Site boundary. Gorhambury Registered Park and Garden is located approximately 2.5km south east of the Site at its closest point.

2.15 The Site does not include any statutory designations for nature conservation. The Site is within the Zone of Influence of the Chilterns Beechwoods Special Area of Conservation (SAC) which is located approximately 8km west of the Site (at its closest point). There are no statutory designated sites of national conservation value, such as Sites of Special Scientific Interest (SSSIs), within 2km of the Site. Howe Grove Wood Local Nature Reserve (LNR) is approximately 2.4km south west of the Site.

[6] Formerly known as Areas of Outstanding National Beauty.

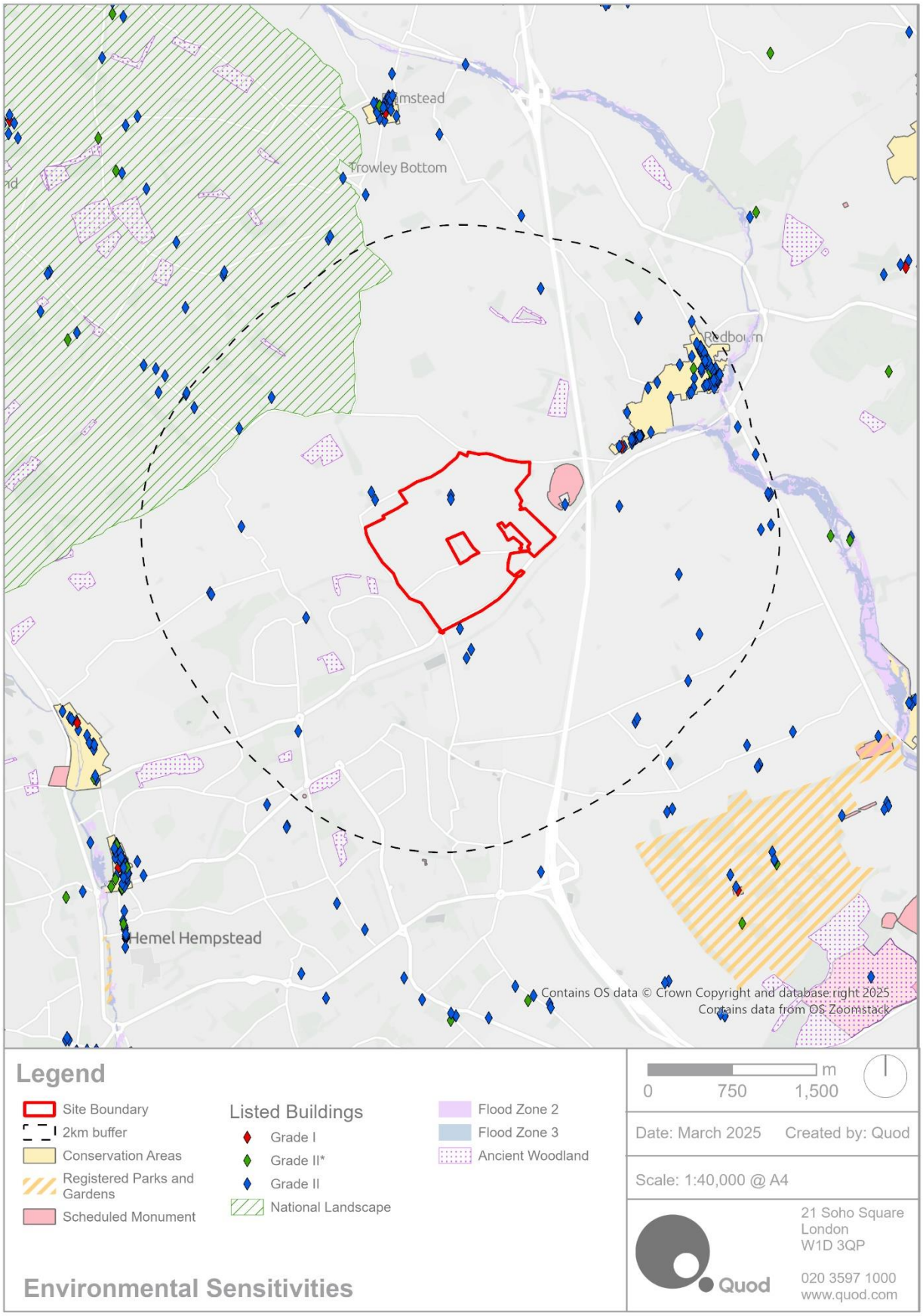
2.16 A Local Wildlife Site (LWS) is located at Great Revel End Farm which is within the north western part of the Site. High Wood LWS is located to the west, outside of the Site boundary.

2.17 The Site does not contain any areas of Ancient Woodland listed on Natural England's inventory and there are no Tree Preservation Orders (TPOs) on the Site. The Site includes some priority habitats including hedgerows and woodland. Some lengths of the hedging within the Site qualify as 'important hedgerows' under the Hedgerow Regulations 1997. The field margins are well defined and comprised of long, unmanaged areas of grass with ruderal vegetation. A large expanse of improved grassland is present on the east of the Site and a small area of semi-improved grassland is also present within the northwest corner of the southern parcel.

2.18 Environment Agency (EA) flood maps show the Site is shown to be located entirely within Flood Zone 1 indicating a below 0.1% annual risk of flooding from river and coastal sources. There are some areas of surface water flood risk associated with an unnamed watercourse and topographical drainage in the south west and east of the Site, and reservoir flood risk on the B487 Hemel Hempstead Road in the south of the Site. There are no notable waterbodies within the Site.

2.19 The Site is not within an Air Quality Management Area (AQMA). The closest are approximately 6.5km to the south-east of the Site (St Albans) and 4.8km south west of the Site (DBC).

Figure 2.2: Environmental Sensitivities within 2km of the Site



3 Description of the Development

Overview of the Development

3.1 The Development proposals will be developed following further technical analysis as part of the EIA process and in consultation with SADC, HGC stakeholders and other consultation bodies. This section provides a brief description of the emerging proposals which are being developed in line with the policy aspirations of Allocation H1 as set out in the Draft SADC Local Plan.

3.2 The planning application will be submitted in outline with all matters reserved apart from principal accesses. The application will be defined by parameter plans and a Development Specification document. SADC, consultation bodies and other stakeholders will be engaged through the design process to inform the proposals.

3.3 A draft description of the Development for the purposes of EIA scoping is provided below.

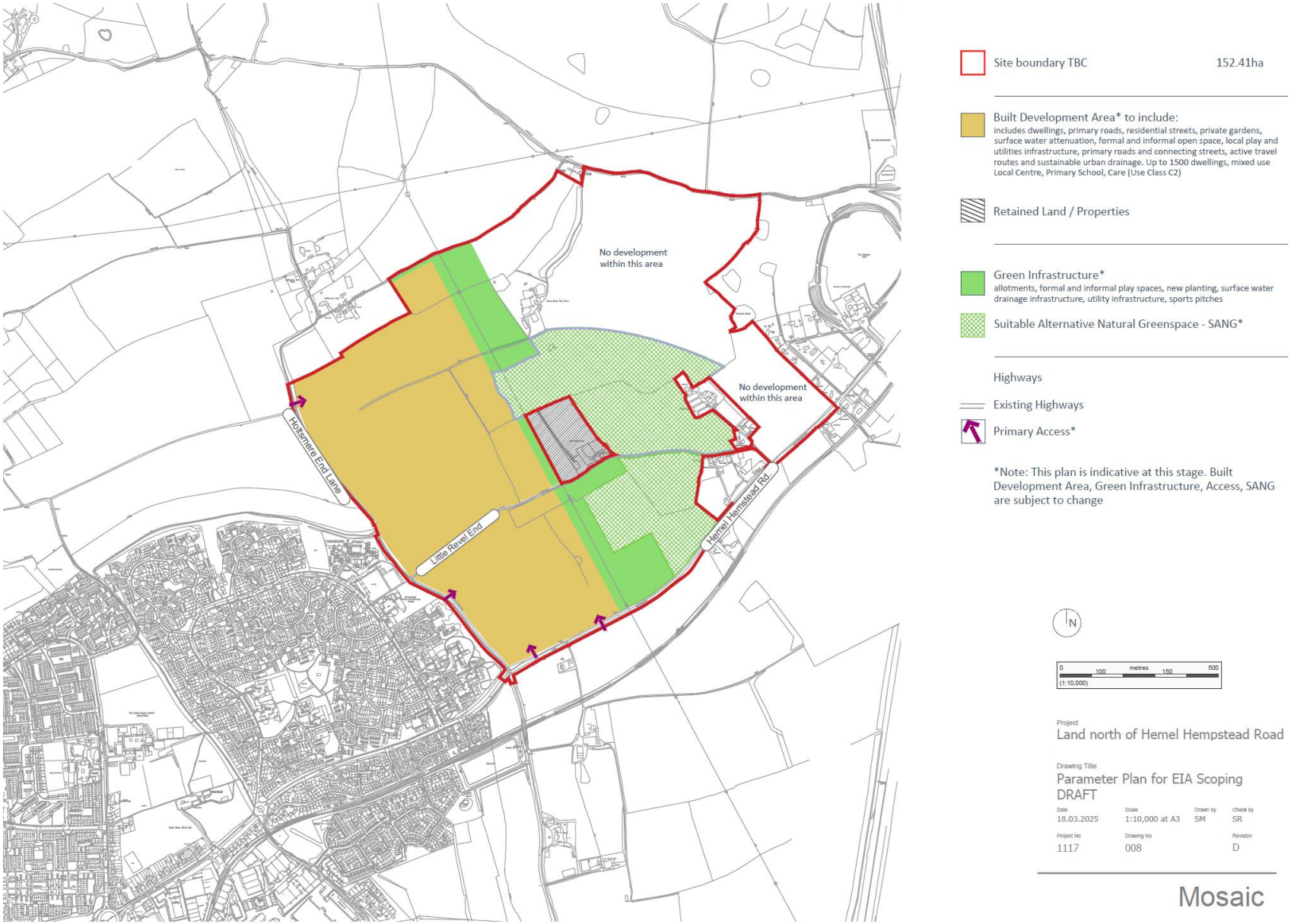
"Outline application for residential-led mixed use development comprising up to 1,500 new dwellings (including residential accommodation and specialist accommodation for older people) (Use Class C3 and C2), a 3FE primary school (including early years provision) (Use Class F1), a local centre (Use Class E, F1 and F2), mobility hub, open space, amenity space, allotments, green infrastructure, sustainable drainage systems, vehicular and active travel routes, and supporting infrastructure and works. All matters reserved except for access junctions to the B487 and Holtsmere End Lane."

Built Development Layout and Massing

3.4 The Site area shown on Figure 1.2 is the likely maximum extent which is aligned to the Site H1 Broad Location. This is not representative of the extent of built development.

3.5 Figure 3.1 is a Draft Parameters Plan that provides an indication of the likely proposed extents of the Development.

Figure 3.1: Draft Parameter Plan



3.6 The west of the Site will form an urban extension to Hemel Hempstead providing new homes, schools and other supporting uses. Appropriate set-backs and easements would be in place for existing residential properties and utility infrastructure, such as those required for the pylons and overhead high voltage power lines.

3.7 The eastern part of the Site includes a substantial area of land to provide a significant area of publicly accessible space for recreation known as a 'Strategic Alternative Natural Greenspace' (SANG). A SANG is an area of land designated for recreational purposes that is designed to offset disturbance and pressures on sites that are protected for their habitat value under Conservation of Habitats and Species Regulations 2017 (as amended). In this case, the Chilterns Beechwoods SAC. The principle and nature of the SANG has already been agreed with Natural England. The extent and parameters of development within the SANG will be further developed in consultation with key stakeholders, including SADC and Natural England.

3.8 The maximum extent of built development and maximum heights will respond to the topographic character of the Site and landscape and visual analysis. Development is expected to be on higher ground, while valley floors and other lower-lying areas will be designated as publicly accessible landscape to support the green/blue infrastructure strategy. Development areas will partly be driven by the valley and plateau topography. Building heights are likely to range between 2 to 4 storeys.

Access

3.9 It is proposed that access to the Development will be taken directly off Redbourn Road via two new junctions providing the potential to segregate car and non-car traffic as follows.

3.10 The main access to the Site will be from a new junction on the B487 which will also serve the East Hemel Hempstead (North) Broad Location site to the south. The Applicant is working collaboratively with The Crown Estate with regard to the design and delivery of this shared access.

3.11 A separate signalised T-junction will be provided further west along Redbourn Road. Pedestrian crossings will also be provided to allow the safe crossing of Redbourn Road. This will enable connections to East Hemel, The Nickey Line (to the south of the Site, see Section 7 for further details) and the wider pedestrian and cycle network.

3.12 The Development will provide vehicular and active travel routes, with connections to the highway, cycleway and pedestrian network including the Nickey Line. The existing PRoWs will be accommodated and opportunities to enhance the existing PRoW network will be explored. An integrated mobility hub with facilities to encourage non-car modes of transport will be provided.

Green Infrastructure

3.13 The Development will provide strategic and local public open space, amenity space, managed woodland, ecological network links, sports facilities, and community food growing opportunities through the retention and expansion of landscape and biodiversity features within the Site. It is expected that the eastern part of the Site will provide a new SANG with facilities for new and existing communities.

3.14 The Development would deliver a minimum of 10% biodiversity net gain through provision of the SANG and a network of green and blue infrastructure.

Construction and Delivery

3.15 The Development is expected to be delivered in phases, although the Applicant will need to reserve flexibility in how the Development comes forward within the outline planning application. For the purposes of EIA, reasonable worst case assumptions will be made relating to construction activities and programme, although it is currently assumed this could be around 12 years.

3.16 Due to the topography of the Site, it is likely that some engineering works including ground re-modelling may be required to create suitable level platforms for the development areas. Principles of ground engineering work would be set out in the application.

4 EIA Methodology

Introduction

4.1 The ES will be prepared in compliance with the EIA Regulations. Reference will also be made to current EIA good practice guidance. This section outlines the general approach to the EIA process.

Consultation and Scoping Opinion

4.2 A programme of consultation with key stakeholders will be undertaken with statutory and non-statutory consultees throughout the Development design and in the lead up to the planning application. Key stakeholders will include:

- SADC Planning, Environmental Services, Design and Conservation;
- Active Travel England;
- British Pipeline Agency;
- DBC, including Planning and Environmental Services;
- Environment Agency;
- Health and Safety Executive;
- Hertfordshire County Council (HCC) Ecology, Essex County Council Place Services (Heritage), Landscape, Lead Local Flood Authority (LLFA), Archaeology, Minerals and Waste;
- Historic England;
- Natural England;
- Local NHS Trusts;
- National Highways;
- Utility providers including Affinity Water, Thames Water, National Gas, National Grid, UK Power Networks; and
- Local residents, landowners, businesses and developers of other Broad Locations (i.e. The Crown Estate).

4.3 In accordance with Regulation 15(4) of the EIA Regulations, the local planning authority is required to consult regarding the proposed scope of the EIA prior to issuing their EIA Scoping Opinion.

4.4 In line with the EIA Regulations, the ES will be ‘based on’ the Scoping Opinion provided by SADC. Each ES topic chapter will set out key points made during scoping correspondence between the project team and stakeholders and will explain how these have been addressed by the EIA process.

Approach to Alternatives

4.5 In accordance with the EIA Regulations, the ES will provide *"a description of the reasonable alternatives…. relevant to the proposed project and its specific characteristics which have been considered by the Applicant and an indication of the main reasons for selecting the chosen option, including a comparison of the environmental effects"*.

4.6 The ES will describe the reasonable alternatives to the Development which have been considered by the Applicant, including:

- The 'do-nothing' scenario - this will outline the consequences of no Development taking place;
- Alternative site extents; and
- Alternative Designs – for example, alternative building layouts, building heights and massing, SANGs, together with the justification for the selection of the final design.

4.7 The Draft SADC Local Plan has identified the Site as suitable for development through the Site's identification as a draft allocation (Broad Location). The Applicants have not considered alternative sites and therefore these will not be considered in the ES.

4.8 The ES will summarise the evolution of the Development design, setting out key factors which influenced the design process.

Significant Effects and Scope of the EIA

4.9 As highlighted by the UK Government Online Planning Practice Guidance[7] (PPG), where considering the scope of EIAs, local planning authorities *"should limit the scope of the assessment to those aspects of the environment that are likely to be significantly affected"*.

4.10 With respect to identifying the likely significant environmental effects associated with the Development, consideration is given to potential effects associated with the construction phase and completed Development. These effects could be both beneficial and adverse and deemed to be 'significant' on the basis of:

- The value / importance of the resources and receptors that could be affected;
- The predicted magnitude of environmental change and / or impact experienced by these resources and receptors, accounting for their size, duration and spatial extent;
- The susceptibility or sensitivity of resources / receptors; and
- Options for avoiding, reducing, offsetting or compensating for any potentially significant adverse effects and the likely effectiveness of such mitigation measures.

4.11 The proposed scope of the EIA has been defined through desktop study, a review of the emerging Development proposals and the professional judgement of competent experts.

[7] Ministry of Housing, Communities and Local Government (2018). Planning Practice Guidance: Environmental Impact Assessment. Available online: https://www.gov.uk/government/collections/planning-practice-guidance [Accessed: 16th October 2018].

4.12 Sections 5 to 15 set out the aspects of the environment that are likely to be significantly affected by the Development and therefore scoped into the ES. A summary of the topics proposed to be scoped into the ES is provided below.

- Socio-economics;
- Health;
- Transport and Access;
- Noise and Vibration;
- Air Quality;
- Water Environment;
- Biodiversity;
- Agricultural Land and Soils;
- Cultural Heritage;
- Climate Change and Greenhouse Gases; and
- Landscape and Visual Impact.

4.13 Potential effects deemed to be 'non-significant' within the above topics are set out within Sections 5 to 15. Section 16 sets out the aspects of the environment where significant effects are unlikely and are therefore proposed to be scoped out of the ES.

Study Area

4.14 The study area for each topic will be based on the geographical scope of the potential for significant effects relevant to the topic or the information required to assess the likely effects, as well as topic-specific guidance and consultation with stakeholders. Further detail is provided in the technical sections (Sections 5 - 15).

Establishing the Baseline and Future Baseline Conditions

4.15 Baseline environmental conditions will be established to enable an accurate assessment of potential changes to such conditions that may occur and to assess the likely significant environmental effects of the Development. Understanding baseline conditions is also important to inform the development via an iterative EIA process and help identify where mitigation may be required to avoid or reduce significant adverse effects and/or opportunities for enhancement.

4.16 For the majority of the topics, baseline conditions will be taken as the existing current conditions on the Site. For some topics, such as air quality, noise and transport, the likely 'future baseline conditions' will be used to inform the assessment. The ES is required to include an outline of the likely evolution of the baseline condition without the Development. The future baseline conditions will be included as far as natural changes from the baseline scenario can be assessed with reasonable effort on the basis of the availability of environmental information and scientific knowledge (i.e. the 'future baseline').

4.17 Baseline data will be collated using a variety of methods including consultation, desk-based research, site surveys, investigations and technical modelling.

Approach to Assessment

4.18 The ES will provide a description of the likely significant effects of the Development on the environment resulting from its construction (including any demolition work) and its existence and operation. The outline approach to the assessment of construction and completed development stage effects are set out below. The level of information provided in the ES on construction and operation will be sufficient information to enable 'the main,' or 'likely significant' effects on the environment to be assessed and the mitigation measures to be described.

Construction Stage

4.19 The ES will provide a description of the physical works associated with the construction stage, including demolition, and an indicative construction programme. Details of activities, the spatial phasing and programme will not be known for the outline components of the planning application. An indicative construction programme will be presented in the ES to inform assessments. At this stage, the construction programme is expected to be around 12 years.

4.20 The assessment of construction effects will rely on cautious 'worst-case' assumptions. Adopting a precautionary approach means that, in reality, effects are likely to be less than predicted. For example, the assessment of construction traffic effects will be based on an assumed 'peak year' of construction activity as a reasonable worst case, when volumes of construction vehicles and on-site activities are likely to be at their highest. Assessments will also make assumptions regarding the phasing of the Development and subsequent introduced receptors where relevant.

4.21 The application will be accompanied by an Outline Construction Environmental Management Plan (CEMP). The Outline CEMP will include a series of standard measures which the Applicant has committed to during the construction phase of the Development and that contractors and relevant parties would need to comply with. The outline CEMP will draw together the mitigation measures identified during the EIA process to avoid or reduce the environmental effects of construction activities.

4.22 In line with IEMA guidance on mitigation[8], the Outline CEMP will rely on mitigation designed into the Development ('primary' mitigation) and will include 'tertiary' mitigation measures – defined as those which *"will be required regardless of any EIA assessment, as it is imposed, for example, as a result of legislative requirements and/or standard sectoral practices. For example, considerate contractor practices that manage activities which have potential nuisance effects"*. Typically, tertiary measures are standardised and often covered by other forms of legislation or controls, therefore they do not need to be presented in extensive detail in the ES.

[8] IEMA. August 2024. Implementing the Mitigation Hierarchy from Concept to Construction.

4.23 An Outline Construction Traffic Management Plan (CTMP) will also accompany the planning application and will be relied on as 'tertiary' mitigation.

4.24 The Outline CEMP and Outline CTMP will be taken into account and form the basis of the assessment of likely significant effects. As such, any effects that might have arisen without this mitigation will not be identified as 'likely effects', as there should be no potential for them to arise.

Completed Development Stage

4.25 The assessment of the completed Development will consider the effects that could arise as a result of the physical existence and operational use of the Development.

4.26 The planning application will be submitted in outline and therefore there is a need for flexibility to be embedded with the design. The assessments in the ES would be consistent with the clearly defined parameters. Where appropriate, the ES would assess the range of possible effects implicit in the flexibility provided by the Rochdale Envelope. Following case law, a 'Rochdale Envelope' approach will be used to address uncertainties and to allow the design to respond to future needs. As such, the Development will be controlled by a series of clearly defined 'parameters' which will be submitted to SADC for approval. These would be developed to ensure they are sufficiently detailed to enable a proper assessment of the likely significant environmental effects and to allow for the identification of necessary mitigation, if required.

4.27 The Rochdale Envelope parameters are likely to include:

- Parameter Plans – these will define the maximum extent and height of built development, and principles of green/blue infrastructure, open space and movement;
- Development Specification – this document will set out the type and amount of proposed land uses, together strategic design principles and embedded mitigation strategies:

4.28 The above documents would be submitted for approval and will control subsequent detailed design and the associated approval of 'reserved matters'. In assessing the 'likely' effects, the ES would adopt a cautious 'worst case' approach to assessments in line with a good practice and EIA case law. Mitigation measures will be 'designed in' wherever possible ('primary' mitigation) and adequate to deal with 'worst case' effects.

Assessment Scenarios

4.29 In summary, the following 'scenarios' are likely to be used to inform assessments:

- **Construction** – for certain assessments, an assumed year is likely to be adopted with is representative of peak construction activity (this is to be confirmed but may be around 2035/2036). Assessments will also consider impacts of the phased delivery on introduced receptors within the Site and in the surroundings as appropriate;
- **Completed Development** – the Development is fully complete and occupied. At this stage, it is anticipated that Transport and Access effects will be assessed against a future baseline year of 2041 which could be representative of the fully completed Development; and

- **Cumulative** – the cumulative scenario will consider the proposed Development with other surrounding development schemes, often referred to as 'cumulative schemes'.

4.30 An interim assessment scenario would only be required where environmental effects are likely to be significant and different to those of the completed Development, for example as a consequence of infrastructure delivery.

4.31 Where future baseline years are used to assess environmental effects, these will be clearly identified within the relevant technical ES chapters.

Determining the Significance of Effects

4.32 Determining the significance of environmental effects is intended to inform decision making. The significance of effects will be determined by specialists with reference to generic assessment criteria or subject-specific criteria for each environmental topic being considered. These criteria will apply a common terminology for significance, classifying whether the effects are major, moderate or minor, that are either adverse, beneficial or negligible, depending on the nature and magnitude of the effect and sensitivity of the receptor(s). The duration (short, medium or long term) and permanence (temporary or permanent) of the effect will also be assessed.

Approach to Mitigation

4.33 During the EIA and design process, the design will appropriately respond to environmental constraints and will seek to include mitigation measures to avoid, prevent, reduce or offset adverse environmental effects. The design will also incorporate opportunities to provide environmental enhancements and improve beneficial effects.

4.34 In line with IEMA's guidance 'Implementing the Mitigation Hierarchy from Concept to Construction'[9], mitigation will be categorised as follows:

- **Primary Mitigation (Inherent):** Modifications to the location or design of the development made during the pre-application stage that are an inherent part of the project, and do not require additional action to be taken. These are an integral part of the proposed development seeking consent and will be outlined in the Description of the Development chapter of the ES and summarised in the topic chapter where relevant;
- **Secondary Mitigation (Foreseeable):** Actions that will require further activity to achieve the anticipated outcome which may be imposed as part of the planning consent, or through inclusion in the ES, e.g. implementation of a Framework Travel Plan; and
- **Tertiary Mitigation (Inexorable):** Actions that would occur with or without input regardless of the EIA process. These include actions that will be undertaken to meet other existing legislative requirements or standard practices used to manage commonly occurring environmental effects (i.e. control of construction related nuisances through a CEMP).

4.35 The environmental effects of the Development will be assessed taking account of primary and tertiary mitigation measures, collectively referred to as 'Embedded Mitigation' measures.

[9] IEMA (2024). Implementing the Mitigation Hierarchy from Concept to Construction. August 2024.

Where secondary mitigation is proposed to mitigate significant adverse effects (referred to as 'Additional Mitigation'), the assessment will clearly state the residual effects following the implementation of those mitigation measures.

4.36 The ES will clearly set out secondary and tertiary mitigation measures and how these will be secured and delivered, for example through planning conditions or other legal agreement or obligation, such as the Section 106 Agreement.

4.37 The final wording of any conditions would be confirmed through the determination process, negotiated between SADC and the Applicant and required to meet the relevant tests. As set out later in this Scoping Report, reliance on these controls has been taken into account, as appropriate, during consideration of those topics proposed to be scoped out of the ES.

4.38 Appendix 4.1 provides an initial indication of primary and tertiary mitigation measures likely to be considered appropriate to mitigate effects with respect to this Development, along with proposed methods of securing these measures through the planning process. In some instances, reliance on these measures has been made for topics proposed to be scoped out of the ES.

Approach to Cumulative Effects Assessment

4.39 The EIA Regulations require that, in assessing the effects of a particular development proposal, consideration should also be given to any cumulative effects. Potential cumulative effects are categorised into two types:

- **Effect Interactions -** occur when two or more different environmental effects arising from the Proposed Development combine to produce a different level of effect / impact experienced by a particular receptor. For example, noise, traffic and air quality effect could all affect an individual receptor; and
- **Cumulative effects -** are those that accrue over time and space from a number of different development activities and projects in geographical proximity to one another, which individually might be insignificant, but when considered together, could create a significant cumulative effect (also referred to as 'Inter-project' effects).

4.40 An outline of the methodology and approach to the cumulative effects assessment is set out below.

Effect Interactions

4.41 There is no established EIA methodology for assessing and quantifying the combined effects of individual effects on sensitive receptors. The approach will use the residual effects identified within the ES to determine the potential for interactions between each technical assessments relating to the same receptor, and consequently the potential for significant effect interactions to arise. The potential for effect interactions will be considered during both the construction and completed Development stages.

4.42 Where there is more than one effect likely to arise on a particular receptor or receptor group, the potential for effect interactions and the scale of the combined effect will be determined based on professional judgement and experience. Where a sensitive receptor is only impacted by one technical assessment category, this receptor will not be considered further as there

would be no possibility for intra-cumulative effects to occur due to their being no effect interaction across different environmental assessment topics.

4.43 In summary, the approach will involve the following steps:

- A review of each technical chapter to identify receptors that may experience an effect of minor, moderate or major significance;
- Receptors identified to have the potential for effect interactions across different topics will be reviewed for the potential for individual effects to interact; and
- The scale and significance of the combined intra-project cumulative effects will be assessed.

4.44 Effect interactions will be reported in a stand-alone chapter in the ES, titled 'Effect Interactions'.

Cumulative Effects (Inter-Project)

4.45 The cumulative assessment is important to ensure that the combined effects of other schemes with the Development are understood appropriately for decision making. The EIA Regulations require the ES to include a description of the *"…the cumulation of effects with other existing and / or approved projects..."*.

4.46 The search area for cumulative schemes has been informed by discussion with the EIA technical specialists to identify the appropriate zone of influence for each topic area. A search radius of 5km has been applied to align with the study area for the viewpoints in the LVIA, although one site beyond this has been included due to its scale.

4.47 In line with the Planning Inspectorate Advice Note 17 on Cumulative Effects Assessment (September 2024)[10], 'other existing and, or approved development' is taken to include existing developments and existing plans and projects that are 'reasonably foreseeable'. Advice Note 17 also establishes that 'other developments' and more specifically 'major developments' need to be identified to assess the probable significant effects against the baseline position. Built and operational developments are included in this baseline. Design Manuals for Roads and Bridges (DMRB) Guidance[11] on cumulative effects will also be taken into consideration, which states that *"cumulative schemes to be considered should be based on the zone of influence of the project together with other projects…which have the potential to result in cumulative impacts."*

4.48 In consideration of these guidance documents, the 'major developments' that should be considered within the cumulative assessment have been defined as those that are:

- Commercial developments (e.g. employment, industrial) - site of 1 hectare or more, or building 1,000 square meters or more of floor space;
- Residential developments - of 150+ dwellings;

[10] Planning Inspectorate, 2024. Nationally Significant Infrastructure Projects: Advice on Cumulative Effects Assessment. September 2024.
[11] Design Manuals for Roads and Bridges, 2020. LA 104 Environmental assessment and monitoring. August 2020.

- Minerals - Working minerals on a site of 2 hectares or more;
- Waste - Managing waste on a site of 0.5 hectares or more;
- Transport infrastructure developments (rail, trunk roads or motorways only); and
- Energy infrastructure developments.

4.49 Cumulative schemes may be considered which are:

- Under construction;
- Permitted application(s), but not yet implemented;
- Submitted applications(s) not yet determined;
- Projects on the Planning Inspectorate's Programme of Projects;
- Identified in the relevant Development Plan (DBC or SADC); and
- Identified in other plans and programmes (as appropriate) which set the framework for future development consents/approvals, where such development is reasonably likely to come forward.

4.50 A search of relevant planning registers and documents was undertaken considering the above criteria, which identified the schemes for consideration. Notably, this includes planned development considered likely to come forward as part of the Draft Local Plan site allocations including the Crown Estate's adjacent emerging proposals for East Hemel Hempstead.

4.51 Table 4.1 provides a 'long list' of cumulative schemes which will be discussed and agreed with SADC and DBC. The location of these schemes is shown on Figure 4.1.

4.52 PINS Advice Note 17 acknowledges that it is not always easy for applicants to assess potential cumulative effects due to the lack of information available and that a pragmatic approach should therefore be taken when determining what is feasible and reasonable. The list of developments listed in Table 4.1 will therefore be further reviewed during the EIA process. Assessments will only be undertaken whether there is potential for 'significant' cumulative effects such as by virtue of overlaps in temporal scope, e.g. overlapping construction periods.

4.53 The cumulative effects of the Development the other existing and, or approved development will be undertaken at a level of detail proportionate to the information available. The assessment will move from a qualitative to a more quantitative assessment as the availability of information and certainty in the other cumulative schemes increases. Cumulative effects of the Development with other cumulative schemes will be reported in each technical ES chapter, along with mitigation measures where necessary.

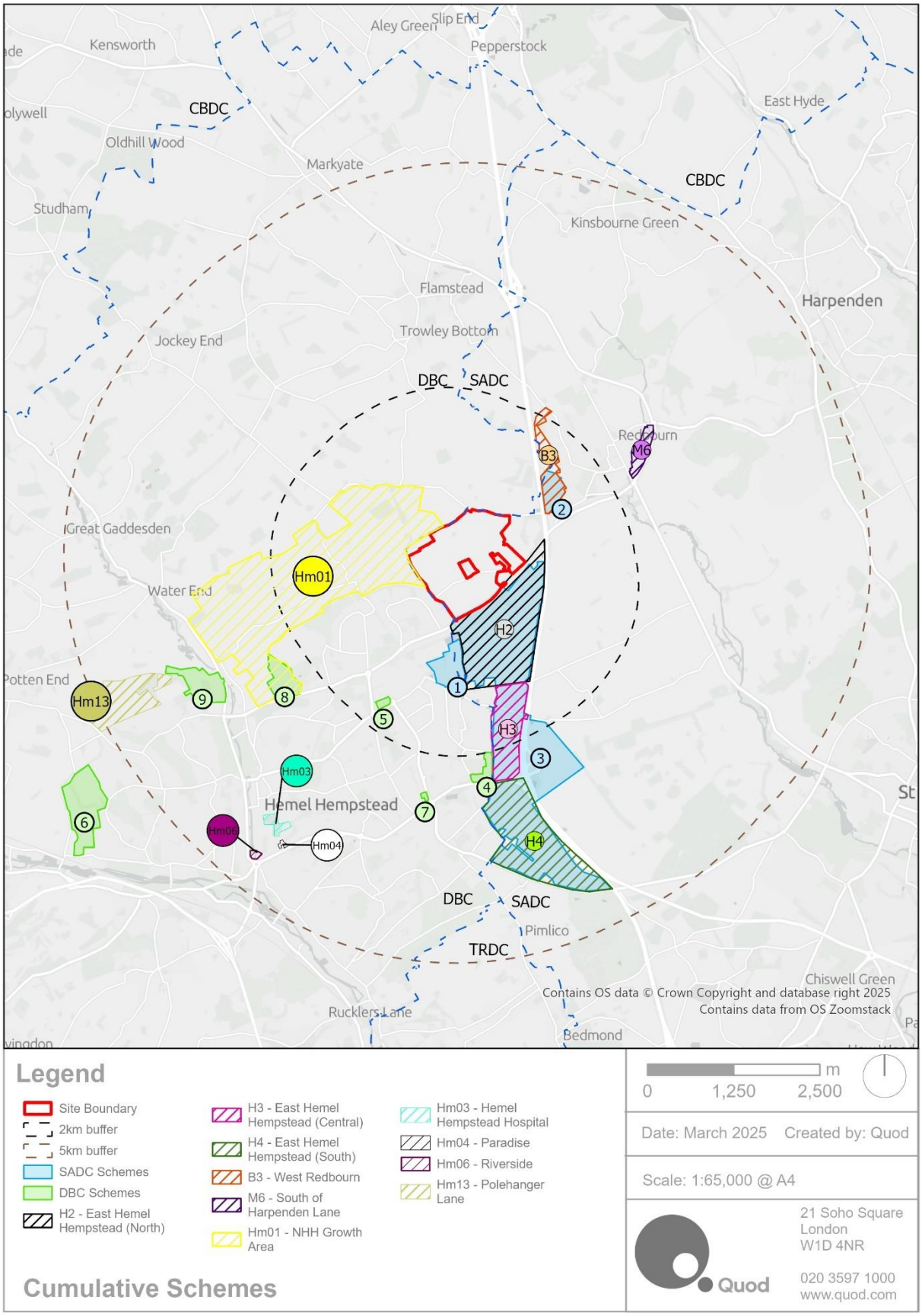
Table 4.1: List of Cumulative Schemes

No.	Planning Ref.	Description	Status	Distance to Site
St Albans City and District Council				
1	5/2016/2845	**Land Between Three Cherry Trees Lane and Cherry Tree Lane, Hemel Hempstead** Phase 2 - Spencers Park Phase 2 West Outline planning application to include up to 600 dwellings (C3), land for primary school (D1), land for local centre uses (A1, A3, A4, A5, D1, D2), land for up to 7,500 square metres of employment uses (B1, B2, B8), landscaping, open space and play area.	Determined – construction not yet started	260m south east
2	5/2021/3631	**Land At Gaddesden Lane, Redbourn** Construction of up to 300 new homes including 35% affordable new homes, new landscaping, public open space and associated infrastructure works.	Under Determination	520m east
3	5/2024//2171	**Land to East of Hemel Hempstead, Hemel Hempstead Road, Redbourn (SADC Site Allocations H2, H3, H4)** Construction of up to 4,000 new dwellings (to include 40% affordable housing, 5 extra-care facilities each comprising 70-80 self-contained units, 3 nursing homes (each of 70-80 beds) and 16 supporting living units); up to 53ha of employment.	Scoping Report submitted December 2024; Scoping Opinion issued February 2025	Adjacent to the south
Dacorum Borough Council				
4	21/03793/MOA	**Land off Green Lane, Hemel Hempstead** Hybrid application for redevelopment of the site in 4 plots to provide up to 26,640 sqm of new commercial floorspace.	Approved – construction not yet started	1.9km south
5	22/03812/MFA	**Land at Eastman Way, Atlas Copco, Hemel Hempstead Industrial Estate, Swallowdale Lane, Hemel Hempstead**	Approved – construction not yet started	1.5km south west

No.	Planning Ref.	Description	Status	Distance to Site
		Demolition of existing building and redevelopment of the site to provide a commercial building (Flexible uses within Class E (g)(iii), B2 and/or B8 of the Use Class Order (including ancillary office provision)), with associated enabling works, access, parking, landscaping, and infrastructure.		
6	4/03266/18/MF	**LA3, Land at West Hemel Hempstead** Hybrid planning application for mixed use proposed development at west Hemel Hempstead, pursuant to Policy LA3 of the adopted site allocations development plan document (2017) to provide for up to 1,100 dwellings (with up to 40% affordable housing).	Approved – construction not yet started	5.5km south west
7	21/04556/MFA	**Plots 1 & 2 Maylands Avenue, Hemel Hempstead** Construction of 234 apartments and 1,486 sqm of commercial floor space, provided in three main buildings ranging from 5 to 9 storeys on two podiums, with associated car parking, landscaping, amenity space and service areas.	Under determination	2.5km south west
8	19/02749/MOA	**Land at Marchmont Farm, Piccotts End Lane, Hemel Hempstead** Outline planning for up to 350 dwellings, land for 5 gypsy & traveller pitches. Vehicular access from A4147, public open space including extension to Margaret Lloyd Park and associated landscaping, infrastructure and drainage. Detailed approval for access arrangements	Under determination	2.4km west
9	21/04508/MOA	**Land West of Leighton Buzzard Road and North of Galley Hill Leighton Buzzard Road, Hemel Hempstead** Construction of up to 390 dwellings (C3 Use), including up to 40% affordable housing and 5% self build, a residential care home for up to 70-beds (C2 use), along with associated landscaping and open space with access from Leighton Buzzard Road.	Inquiry taking place in February and March 2025 (appeal ref: APP/A1910/W/24/3345435)	3.3km west

No.	Planning Ref.	Description	Status	Distance to Site
SADC Site Allocations				
B3	West Redbourn	Residential-led scheme of approximately 545 units and a new 2FE Primary school.	N/A	520m east
M6	South of Harpenden Lane, Redbourn	Residential-led scheme of approximately 68 units.	N/A	1.9km east
Dacorum Borough Council Site Allocations (draft DBC Local Plan)				
Hm01	North Hemel Hempstead Growth Area	Around 1,500 dwellings by 2041, with up to 3,500 additional homes (to include provision for older people) to be delivered beyond the plan period subject to masterplanning; three 3FE and one 2FE primary schools (including nursery provision on three); and one 8FE secondary school. Gypsy and Traveller site for 8 pitches	N/A	0m west
Hm03	Hemel Hempstead Hospital	Around 450 dwellings (to include provision for older people), subject to master planning and a 3FE primary school (including nursery provision).	N/A	3.9km south west
Hm04	Paradise	Around 350 dwellings, subject to masterplanning with Class E and F1 uses at ground floor level where viable.	N/A	4km south west
Hm06	Riverside	Around 500 Homes subject to masterplanning with main town centre uses appropriate at ground floor level and expansion of the car park.	N/A	4.4km south west
Hm13	Polehanger Lane	Around 750 homes including provision for older people, subject to master planning. A neighbourhood centre to include a community building. A 2FE Primary school (including nursery provision). Suitable Alternative Natural Greenspace (16ha).	N/A	3.8km west

Figure 4.1: Cumulative Schemes



Structure of the ES Technical Chapters

4.54 Each environmental topic scoped into the ES will be structured as set out in Appendix 4.2.

Co-ordination with Other Regimes

4.55 As set out in Section 2, the Site is within the Zone of Influence (ZoI) of the Chilterns Beechwoods SAC. The SAC is a statutory designated sites for nature conservation under the Conservation of Habitats and Species Regulations 2010[12] (as amended) (the 'Habitats Regulations'). SADC will therefore be required to make an Appropriate Assessment of the planning application.

4.56 Where a development is subject to EIA and there is also a requirement to carry out an assessment under regulation 61 of the Habitats Regulations (a 'Habitats Regulation Assessment' (HRA), the local planning authority, must where appropriate, ensure that the HRA and the EIA are co-ordinated (regulation 27). EIA identifies and assesses likely significant environmental effects whilst HRA focuses on likely significant effects to the integrity of the designated site.

4.57 The EIA and HRA processes will be co-ordinated and the planning application will be accompanied by a Shadow HRA report. The scope and approach to the Shadow HRA and ecological impact assessment as part of the EIA will involve further consultation with SADC and Natural England. The Shadow HRA rely partly on the conclusions of the HRA of the Draft Local Plan[13] in respect of the North Hemel Broad Location alone and in-combination with other plans and projects. The approach to the in-combination assessment will be subject to agreement with SADC and Natural England.

4.58 The Shadow HRA will consider the efficacy of the new SANG which is proposed as part of the Development as well as the Strategic Access Management and Monitoring Strategy (SAMMS) which relies on financial contributions from developers for funding.

[12] Secretary of State, 2019. Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019. January 2020

[13] AECOM. September 2024. Habitats Regulations Assessment Regulation 19 Local Plan. St Albans City & District Council.

5 Socio-Economics

Key Baseline Considerations

The Site is in the Redbourn ward within SADC to the east of the town of Hemel Hempstead. The Site is predominantly used for agriculture, and employment associated with this use is likely to be low. There is also currently very low demand for social infrastructure (e.g. schools and healthcare) as there is only a single residential property within the Site. The Site is not known to currently offer any recreation or leisure uses other than the use of PRoWs.

Study Area

In the absence of guidance or policy available to inform the definition of appropriate study areas, it is reasonable to define study areas based on an understanding of relevant local and wider economic geographies, and the extent to which socio-economic effects are likely to be contained within these geographies. These are as follows:

- Local area – Redbourn ward (St Albans); Watling (Dacorum); Woodhall Farm (Dacorum);
- District area – St Albans district and Dacorum district; and
- Region - East England.

The study area for identifying community facilities are as follows:

- The primary school place planning areas of: Hemel Hempstead East, Hemel Hempstead North-East, Hemel Hempstead North-West, and Redbourn for primary schools;
- The secondary school place planning areas of: Hemel Hempstead and St Albans for secondary schools;
- 5km from the Site for healthcare services (GPs); and
- 5km of the Site for open space and play space.

A 5km radius is considered appropriate for healthcare and open/play space given the nature of the Site. A 5km radius enables existing facilities within the nearest settlements to the Site to be considered in the context of the proposals.

Receptors

Construction

- The construction industry and its employees.

Completed Development

- The local economy and labour market, e.g. local businesses and economically active residents;
- The local housing market including housing need within SADC;
- Existing local social infrastructure and its users, specifically:
  - Primary schools (Reception to Year 6) within the defined study area;
  - Secondary schools (Years 7 to 11) within the defined study area;
  - GP surgeries within the defined study area; and
  - Open space and play space within the defined study area; and
  - Existing local centres, community and leisure infrastructure within the defined study area.
- New residents (including specialist accommodation) and employees to be accommodated by the Development.

Assessment Methodology
Baseline Characterisation Approach
A desk-based study will be undertaken to determine baseline conditions which will include review of the following sources: ▪ Census (2021)[14]; ▪ Business Register and Employment Survey (2023)[15]; ▪ Claimant Count (2024)[16]; ▪ Index of Multiple Deprivation (IMD) (2019)[17]; ▪ Annual Schools Census data (2024)[18] and information from relevant St Albans school admission documents; ▪ Data on healthcare services from NHS Digital (2024)[19]; and ▪ Open space and play space information from Ordnance Survey data[20], alongside a desktop study and review of relevant local authority planning policy, guidance, and/or evidence base documents. The review will be supplemented by information from the Applicant and relevant evidence base documents from the Draft Local Plan, including SADC Draft Open Space Study (2023), SADC Infrastructure Delivery Plan (2024), HGC Socio-Economic and Demography Study (Hatch 2024), SADC Playing Pitch and Outdoor Sport Strategy & Action Plan (2023), HGC Green Infrastructure Strategy, and Higher Learning and Research Opportunities Study (Hatch 2024) A Site survey is not proposed to be undertaken as the information collected / to be collected through the desk study review sufficient to inform the assessment along with a site visit if necessary.
Scoped In Effects
Construction ▪ Generation of employment during the construction stage. *Completed Development* ▪ Net additional employment opportunities in new non-residential floorspace (this will allow consideration of any loss in employment from existing uses on-site); ▪ Delivery of new homes (net additional) contributing to local housing targets; ▪ The effect of the population accommodated by these new homes on social infrastructure – specifically education (primary and secondary), primary healthcare (GPs), open space and play space provision; and ▪ Spending associated with the new residents and employees brought to the Site by the Development.
Non-Significant Effects
▪ Indirect construction effects – supply chain effects and spending by construction workers are likely to be beneficial but not significant within the assessment areas. As the number of

[14] Office for National Statistics (2021). Census.
[15] Office for National Statistics (2023). Business Register and Employment Survey: open survey.
[16] Office for National Statistics (2024). Claimant Count.
[17] Ministry of Housing, Communities and Local Government (2019). Index of Multiple Deprivation.
[18] Department for Education (2024) Schools, Pupils and their Characteristics. (Annual School Census data).
[19] National Health Service (2024) NHS Digital – Workforce Data Report. NB – it is likely that 2025 data may be available at the time of assessment.
[20] Ordnance Survey, Live Data Source. OS Open Greenspace.

construction workers on-site would fluctuate over the course of the development programme and will depend on construction methodology and phasing, it is challenging to quantify the level of spending captured locally robustly based on the information likely to be available at the planning stage.

- Multiplier effects – these economic effects arise from construction supply chain and procurement vary depending on construction method and individual contractors. The spatial context of supply chain effects also ranges from local to national and even international depending on the supply and sourcing of construction materials and other suppliers. These details will not be available at the outline planning stage therefore the magnitude of impact would be challenging to quantify meaningfully. The effects are likely to be beneficial but not significant in the context of the surrounding area.

Method

Construction

- Current agricultural employment on-site is expected to be low but estimated using information from the Applicant. If the information is not available, existing agricultural employment and therefore displacement as a result of construction will be estimated using information on agriculture employment from Defra.
- Temporary construction-related employment effects during the construction works will be assessed using the Construction Industry Training Board (CITB) Labour Forecasting Tool[21]. This tool uses estimated forecast costs associated with the construction of the Development provided by the Applicant.

Completed Development

- Delivery of housing: this will be assessed against relevant SADC housing targets based on the proposed maximum number of homes. The assessment will be informed by an indicative housing mix which will provide an indication of dwelling size and tenure;
- Population and Child Yield: the estimated resident population of the Development will be calculated based on average household sizes informed by 2021 Census data to inform assessments relating to social infrastructure. The estimated number of children expected to live on-site will be assessed based on locally-specific child yields;
- Education: Demand for education facilities will be assessed by considering primary and secondary age child yield (Reception to Year 11) against existing capacity in schools surrounding the Site and in the context of proposed provision on-site;
- Health Services: GP demand will be assessed against a benchmark of the national average provision of patients per GP. This will be used to determine the number of additional FTE doctors required as a result of the Development;
- Open space and playspace: Demand effects arising from new resident population will be considered against local policy requirements (if applicable), such as the SADC Open Space Study and SADC Playing Pitch and Outdoor Sport Strategy & Action Plan[22].
- Local centres, leisure and community facilities: Demand effects will be assessed by reviewing provision of relevant facilities within the study area. The impact of the Development on this baseline will then be considered qualitatively considering the current context alongside how

[21] Construction Industry Training Board (CITB) (2025). Labour Forecasting Tool.
[22] SADC, 2023. St Albans City and District Council Playing Pitch and Outdoor Sport Strategy and Action Plan.

local facilities provision is expected to change as a result of components to be delivered within the Development.

- Direct Employment: Effects from employment generated by the completed Development will be assessed by applying standard job density ratios from the Homes and Communities Agency (HCA) Guidance[23] to the floorspace schedule which will form part of the planning application. The predicted number of jobs produced will then be considered in the context of current levels of employment in the local area and beyond; and
- Spending: An estimate of spending generated as a result of the completed Development will be calculated using the latest available average household spending figures and an average figure for daily worker spending[24] for employees.

Cumulative

- The cumulative assessment will be informed by a review of the information in the public domain for the identified cumulative scheme(s). The level of assessment will be proportionate to the level of certainty in the scheme, e.g. whether it has planning permission.

Assessment Criteria

The assessment of potentially significant effects on sensitive receptors will consider the receptor sensitivity (on a scale of high, medium, low and negligible) and the magnitude of change (on a scale of high, medium, low and negligible) to determine significance (on a scale of major, moderate, minor and negligible). The criteria to be used in the assessment have been applied on many similar schemes elsewhere and are therefore not represented here. Impacts will be quantified where possible. Where quantification is not possible, qualitative assessments will be used and justified. Residual effects that are concluded to be major or moderate are considered to be significant.

Approach to Mitigation

Good practice measures secured through the Outline CEMP would be in place to avoid significant adverse socio-economic effects on the local population during construction.
The mix of land uses and provision of green infrastructure and open space will form the primary mitigation measures for the Development together with other standard developer obligations. Additional mitigation will be determined at the assessment stage, depending on the scale of effect.

Assumptions and Limitations

The following assumptions and limitations have been identified:

- The assessment will be made against a benchmark of current socio-economic baseline conditions prevailing at, and within, the study area of the Site;
- Due to the outline nature of the application, the assessment will be undertaken based on the worst-case assumption for each sub-topic of the socio-economic assessment. For example, for the housing assessment will utilise the minimum number of residential homes to be brought forward, as this will contribute the least to SADCs housing targets, but for the assessment of population and child yield the maximum number of residential homes will be assessed as this will create the largest demand on the surrounding healthcare and education infrastructure; and
- As with any dataset, baseline data will change over time. The most recent published data sources were used in this assessment; however, it should be noted that in some instances this

[23] Homes and Communities Agency (2015). Employment Density Guide – 3rd Edition.
[24] Visa Europe (2014). UK Working Day Spending Report – adjusted to reflect inflation.

data may be older than the true baseline (i.e. 2025). This is an unavoidable limitation that is not considered to adversely impact the validity of the assessment undertaken to identify the likely significant socio-economic effects.

6 Human Health

6.1 In line with EIA Regulations, the impacts of human health will be assessed within the EIA process in relation to the Development. An initial screening assessment has been undertaken to inform this section of the Scoping Report, as presented in Appendix 6.1.

6.2 A standalone Health Impact Assessment (HIA) will form part of the EIA to avoid duplication of assessments.

Key Baseline Considerations
On the edge of Hemel Hempstead and south west of Redbourn, the Site is in the Redbourn Ward. Census data records the self-reported health status of the population. In 2021, 85% residents living in the Redbourn ward were recorded as being very good or good health. This compares to 88% for SACD and 83% for the East region as a whole. The Hertfordshire Health and Wellbeing Strategy (Hertfordshire County Council, 2022) outlines the vision for improving health and wellbeing and addressing health inequalities and identifies a number of health priorities which include: ▪ Good emotional and mental wellbeing throughout life; ▪ A healthy standard of living for all; and ▪ Healthy and sustainable places and communities. The HGC Spatial Vision establishes four Pillars, all of which reinforce the aspirations to promote healthy lifestyles and respond to the climate crisis.
Study Area
For health, the study area would involve the spatial extent of relevant populations likely to be affected by the Development. This would be dependent on the spatial extent of any relevant environmental effects, e.g. noise, traffic, air quality, socio-economic.
Receptors
The study area will include populations which are likely to be affected by the Development, including the new resident population and neighbouring communities, as appropriate. It is recognised that there would be variation in the level of sensitivity due to a series of factors such as age, socio-economic deprivation and the prevalence of any pre-existing health conditions. Some groups can be considered more vulnerable to changes in environmental and socio-economic factors (both adversely and beneficially) when compared to the general population.
Methodology
Baseline Characterisation Approach
Baseline health conditions would be obtained using publicly available health data including: ▪ Planning policy and evidence base for the Draft Local Plans (DBC and SADC); ▪ Health-focused baseline profile (drawing on publicly available information from the Office for National Statistics (ONS); Office for Health Improvement and Disparities (OHID) and the Department for Health and Social Care (NHS Fingertips data); and

- Local health priorities (as set out in the relevant Joint Strategic Needs Assessments (JSNA)[25], Hertfordshire Community NHS Trust Health and Wellbeing Strategy and informed through consultation with the Healthy Places team at HCC).

Scoped In Effects

In line with IEMA Guidance on Effective Scoping of Human Health in Environmental Impact Assessment (2022)[26], the assessment of human health will focus on any relevant significant residual adverse effects identified through the wider EIA process which could have an impact on human health at the population level (determined by the study areas of each assessment and/or the extent of potential likely significant effects identified on receptors, combined). Only where a significant residual adverse effect has been identified elsewhere in the EIA process will the potential health effect be assessed. This will be undertaken at a general population level and vulnerable groups level[27] and will follow the standard approach to sensitivity, magnitude and significance.
At this stage in the application process, it is not possible to anticipate the likely significant residual effects arising from the proposals.
Appendix 6.1 provides a high level analysis of ways in which the Development could influence recognised wider determinants of health. This has been prepared in line with IEMA guidance[28] and considers the likelihood of potential significant health effects of each in turn.
The scope of the human health chapter will be kept under review once the other technical chapters are completed.

Non-Significant Effects

No significant adverse health effects are anticipated, however no health effects are proposed to be scoped out at this stage.

Method

The assessment of potential health effects will be undertaken at a general population level and vulnerable groups level[29] and will follow the standard approach to sensitivity, magnitude and significance (see Assessment Criteria below).
It is expected that the assessment will draw on the conclusions of several inter-related disciplines including (but not necessarily limited to): Air Quality; Transport; Noise and Vibration; and Socio-Economics.
The assessment will follow a source-pathway-receptor model to identify and assess health effects associated with the Development. This means that a source itself does not constitute a health risk since there must be a pathway of exposure to result in an adverse risk to human health. The same is true for potential beneficial effects on health.

Assessment Criteria

[25] https://www.hertfordshire.gov.uk/microsites/jsna/jsna-documents.aspx?searchInput=&page=1&resultsPerPage=10&view=card
[26] Institute of Environmental Management and Assessment, (2022); Effective Scoping of Human Health in Environmental Impact Assessment.
[27] Vulnerable groups are those considered to be particularly sensitive to changes in environmental and socio-economic factors (both adversely and beneficially) whereby they could experience disproportionate effects of health when compared to the general population. This includes: the elderly, young children, unborn children and their mothers, socio-economically deprived; unemployed etc.
[28] Institute of Environmental Management and Assessment, (2022); Effective Scoping of Human Health in Environmental Impact Assessment.
[29] Vulnerable groups are those considered to be particularly sensitive to changes in environmental and socio-economic factors (both adversely and beneficially) whereby they could experience disproportionate effects of health when compared to the general population. This includes: the elderly, young children, unborn children and their mothers, socio-economically deprived; unemployed etc.

The assessment of effects will consider the receptor sensitivity (on a scale of high, medium, low and negligible) and the magnitude of change (on a scale of high, medium, low and negligible) to determine significance (on a scale of major, moderate, minor and negligible). The criteria to be used in the assessment have been applied on many similar schemes elsewhere and are therefore not represented here. Impacts will be quantified where possible. Where quantification is not possible, qualitative assessments will be used and justified. Residual effects that are concluded to be major or moderate are considered to be significant.

Approach to Mitigation

The EIA process would be used to understand how people and communities can benefit from the Development and how they could potentially be adversely affected from a health perspective. Health-related mitigation measures may include those that act on the wider determinants of health as well as those that target health outcomes. This may mean that many health-related measures are covered in other EIA chapters, e.g., to avoid or reduce vehicle emissions, thereby preventing / minimising health effects from arising.

Through the Development, the Applicant will explore opportunities to 'design in' health and wellbeing, e.g. providing inclusive active travel network, inclusive access to open space, sports and leisure uses which maximise opportunities for improved accessibility, mental and physical health. In developing the proposals, the design team will have regard to the HCC Health and Wellbeing Planning Guidance, Public Health England's Spatial Planning for Health evidence resource and the NHS England 'Putting Health into Place, 10 Principles' Guidance document[30].

Assumptions and Limitations

The following assumptions and limitations have been identified:

- The assessment will be made against a benchmark of current health conditions prevailing at, and within, the study area;
- Due to the outline nature of the application, the assessment will be undertaken based on the worst-case assumption for health determinant; and
- As with any dataset, baseline data will change over time. The most recent published data sources were used in this assessment. However, it should be noted that in some instances this data may be older than the true baseline (i.e. 2025). This is an unavoidable limitation that is not considered to adversely impact the validity of the assessment undertaken to identify the likely significant human health effects.

[30] NHS, 2019. Putting Health Into Place: Executive Summary. September 2019.

7 Transport and Access

Key Baseline Considerations
Primary vehicular access to the Site is currently provided from Hemel Hempstead Road (B487), however it can also be accessed from Holtsmere End Lane and Gaddesdan Lane. It is anticipated both primary and secondary access to the Site will be from Hemel Hempstead Road. The Site is in close proximity to strategic routes and benefits from direct linkages via Hemel Hempstead Road to the A5183 Dunstable Road and the M1 motorway to the east. The northern and eastern Site boundaries are formed largely by Holtsmere End Lane (a single carriageway rural lane). Gaddesdon Lane forms part of the north-western Site boundary and Hemel Hempstead Road forms the southern boundary. Little Revel End, a single carriageway rural lane serving a small number of residential properties, divides the centre of the Site east to west. The closest bus stops are located on Redbourn Road approximately 75m from the south west corner of the Site, served by the hourly Route R46 between Luton and Hemel Hempstead. To the west, Route 2 provides three services per hour in a circular route around the Woodhall Farm residential estate towards Hemel Hempstead town centre. This route has an 11-minute journey to and from Hemel Hempstead town centre, serving Apsley Railway Station on its way. A number of Public Rights of Way (Redbourn 009, 010 and 011) cross the Site as shown by the HCC Definitive Map and replicated on Figure 2.2. The Nickey Line is a former railway line to the south of Hemel Hempstead Road that links Hemel Hempstead, Redbourn and Harpenden. It now forms part of the National Cycle Network and provides a footpath and cycleway linking Hemel Hempstead to Harpenden.
Study Area
An Urban Transport Model (known as a Paramics microsimulation model) exists for Hemel Hempstead, owned by HCC. The Applicant has agreed to use this for the purpose of the planning application, and this modelling will form the main basis of the assessment. The extent of the Paramics model is shown on Figure 6.1. The screening of road links for assessment within the ES will use IEMA Guidelines (2023)[31] which suggests two broad rules to identify the appropriate extent of the assessment area, which are as follows: ▪ Rule 1: Include highway links where traffic flows will increase by more than 30% (or the number of heavy goods vehicles will increase by more than 30%); and ▪ Rule 2: Include highway links of high sensitivity where traffic flows have increased by 10% or more. It is expected that the link assessment in the ES chapter will comprise the primary routes in the surrounding area. These are likely to include the M1, A414, A4147, and Redbourn Road as well as the lower classified roads nearby, such as Green Lane, Three Cherry Trees Lane, and Cherry Tree Lane. Following receipt of outputs of the Paramics model, an appropriate spatial extent of links to be assessed will be agreed with HCC Highways. The spatial extent of the model will also take into

[31] IEMA, 2023. IEMA Guidelines - Environmental Assessment of Traffic and Movement. July 2023.

account any sensitive designated ecological sites and potential for associated impacts from road traffic emissions when in proximity to road links.

Figure 7.1: HCC Highways Paramics Model Extent

Receptors

There are no commonly agreed definitions of sensitivity to changes in traffic flow and in line with the IEMA Guidelines for the 'Environmental Assessment of Traffic and Movement' (2023) ('IEMA Guidelines'), professional judgement will be required.

A review of each highway link within the Study Area in relation to the key factors which affect the sensitivity of that link will be undertaken. Receptors will include non-motorised users using the highway and PRoW networks (pedestrians, cyclists and equestrians), and drivers and passengers of motorised vehicles using the highway network. The scale of sensitivity that would be applied and considered within this assessment are as follows:

- Very High – Receptors of greatest sensitivity to traffic flow: schools, colleges, playgrounds, accident clusters, retirement homes, roads without footways that are used by pedestrians.
- High – Traffic flow sensitive receptors: congested junctions/links, doctors' surgeries, hospitals, shopping areas with roadside frontage, roads with narrow footways, recreation facilities.
- Medium – Receptors with some sensitivity to traffic flow: places of worship, public open space, tourist attractions and residential areas with poor footway provision.
- Low – Receptors with low sensitivity to change in traffic flows: residential areas with adequate footway provision.
- Negligible – Receptors with no measurable sensitivity to change in traffic flows: all other areas.

In relation to PRoWs, the assessment will consider existing PRoW and other access networks; pending PRoW 'claims'/applications (if relevant to the Site) and the HCC Rights of Way Improvement Plan.

Methodology

Baseline Characterisation Approach

The transport and access baseline conditions will be informed by the following:

- Review of relevant Local Plan evidence base documents and HCC documents (e.g. Local Transport Plan and Rights of Way Improvement Plan);
- Site visit including the local area and detailed review of existing local highway and transport networks, including networks for non-motorised users;
- Desktop study, including data on public transport routes, HCC Personal Injury Collision (PIC) data, and HCC Definitive Map of Public Rights of Way;
- Hemel Hempstead Paramics microsimulation traffic model;
- Pre-application discussions with SADC and HCC; and
- A review of the existing highway conditions, including walking and cycling opportunities and public transport provision.

Future baseline conditions will be forecast within the Paramics traffic model with reference to relevant Trip End Model Presentation Programme (TEMPro) growth factors and other planned growth.

Scoped In Effects

The Development has the potential to result in the following impacts during the construction and completed Development stages which could potentially lead to significant effects due to changes in vehicular travel demand:

- Severance of communities (including PRoWs within and surrounding the Site);
- Road vehicle driver and passenger delay;
- Non-motorised user delay;
- Non-motorised amenity;
- Fear and intimidation on and by road users; and
- Road user and pedestrian safety.

Non-Significant Effects

The following environmental effects associated with transport and access are to be considered within other ES Chapters and consequently will be scoped out of the assessment:

- Noise and vibration;
- Visual impact;
- Air pollution and dust and dirt;
- Ecological impact; and
- Heritage and conservation.

This is in line with the IEMA Guidelines: Environmental Assessment of Traffic and Movement (2023). Hazardous loads would be scoped out as none are expected.

Method

The Transport and Access chapter will be informed by a Transport Assessment (TA) and will consider the likely significant effects that could arise on the transport network during the construction works and once the Development is complete. The assessment will apply magnitude of impact and significance criteria developed from the IEMA Guidelines which have been applied successfully elsewhere on similar schemes in relation to:

- Severance of communities (including PRoWs within and surrounding the Site);
- Road vehicle driver and passenger delay;
- Non-motorised user delay;
- Non-motorised amenity;
- Fear and intimidation on and by road users; and
- Road user and pedestrian safety.

Construction

The assessment will consider the effects of the peak activity period of the construction phase, taking into account standard mitigation measures that are proposed to be in place. This will ensure that the assessment is robust and considers the period in which construction traffic impacts are anticipated to be at their highest. At many points in the construction programme, traffic is likely to be considerably lower than that which will be assessed for the completed Development. Construction traffic data will be based on reasonable worst-case assumptions informed by similar scale projects and principal routes as defined by the Framework CTMP. Construction effects will be assessed against the baseline year flows from the Paramics model.

Completed Development

An assessment of multi-modal trip generation will be undertaken for the full Development. Development-generated vehicular trips will be used to inform the Paramics model across the scenarios listed below. The Paramics model will be used to determine the background traffic, future year traffic (accounting for all relevant cumulative schemes and background growth) and will distribute and assign vehicle trips from the Development.

The ES chapter will use the traffic generation analysis prepared as part of the TA to quantify the levels of significance of the environmental effects. The chapter will set out the requisite mitigation measures and the residual effects once these are incorporated into the proposals. The scope of the TA would be developed through a separate TA scoping exercise with HCC which would define the study area and scope of the TA.

The methodology used in the ES chapter will follow the guidance set out in the IEMA Guidelines as this is the recommended tool for the appraisal of environmental effects of road traffic and identifies appropriate standard methodologies for assessment. The ES chapter will assess the following time periods for each scenario: AM and PM peak hours, and Daily.

Cumulative Assessment

The assessment will assess likely significant construction transport and access effects around the Development, factoring in the influence of relevant cumulative schemes. The cumulative schemes for inclusion in the assessment are to be informed by the relevant local authorities, i.e. SADC and DBC. For some, traffic flows are likely to be included within the North Hemel Paramics model although additional assessment may be required to account for construction stage traffic data.

The possible inclusion in the Paramics model scenarios of other allocations within the HGC Growth Area will be discussed and agreed with the relevant local authorities and HCC. Consideration of specific cumulative schemes will be included subject to appropriate data being available in the public domain to allow a meaningful assessment.

Assessment Scenarios

In summary, the Transport and Access assessment would be informed by the following scenarios:

Baseline:

- The year used for the Baseline is 2019 as this is the last date before COVID when the traffic model for Hemel Hempstead was updated on behalf of HCC and this model has recently (i.e. in 2024) been agreed with HCC / National Highways as acceptable for use.

Construction:

- Baseline + Peak Construction Traffic – Baseline plus peak construction traffic from the Development. This scenario would consider the anticipated busiest year for construction vehicle movements to ensure a robust assessment, with reasonable worst case assumptions on the phased approach to construction;
- Baseline + Peak Construction Traffic + Cumulative Schemes – Baseline traffic plus peak construction from the Development and other cumulative schemes. This assessment may be qualitative or quantitative subject to the availability of data on other schemes.

Completed Development:

- Future Baseline – Future Baseline (Baseline plus committed developments, including growth factors and cumulative schemes to be agreed with relevant authorities).
- Future Baseline + Development (Completed) – Future Baseline plus the Development as fully occupied and highway infrastructure (i.e. Strategic Transport Corridor) in place.

There may be the need to assess some intermediate phases of completion of the Development and its associated infrastructure which could comprise a combination of construction and operational traffic. This will however be dependent on the proposed delivery of associated highways infrastructure (i.e. Strategic Transport Corridor) and would be subject to further discussions with HCC.

Assessment Criteria

The assessment of potentially significant effects on sensitive receptors will consider the receptor sensitivity (on a scale of high, medium, low and negligible) and the magnitude of change (on a scale of high, medium, low and negligible) to determine significance (on a scale of major, moderate, minor and negligible). The assessment will quantify impact where possible. Where quantification is not possible, qualitative assessments will be used and justified. Effects that are judged to be major or moderate are considered to be significant. Assessment criteria would be used which are based on the IEMA Guidelines and applied by i-Transport successfully elsewhere on similar projects.

Approach to Mitigation

Construction

Tertiary mitigation will include the Outline CEMP which will include standard measures to avoid or minimise potential traffic related effects such as noise, vibration, dust on road users and other receptors, including PRoW users. An Outline CTMP will set out key construction routes and standard measures designed to minimise disruption to existing transport routes and users.

Completed Development

The Development will be designed to maximise mode share by sustainable modes, for example providing an accessible mobility hub, active travel routes with links to the surrounding walking and cycling networks, and a mix of uses which reduce the need to travel.

Assumptions and Limitations
The following assumptions and limitations have been identified: ▪ The assessment will be made against a benchmark of current transport and access baseline conditions prevailing at, and within, the study area of the Site; and ▪ As with any dataset, baseline data will change over time. The most recent published data sources were used in this assessment; however, it should be noted that in some instances this data may be older than the true baseline (i.e. 2025). This is an unavoidable limitation that is not considered to adversely impact the validity of the assessment undertaken to identify the likely significant transport and access effects.

8 Air Quality

Key Baseline Considerations
Existing Baseline The Site is not within an AQMA. SADC has declared an AQMA for exceedances of the annual mean nitrogen dioxide (NO_2) and 24-hour mean particulate matter (PM_{10})[32] objectives. The AQMA is approximately 6.5km to the south east of the Site and encompasses the properties 1-7 London Road and 2-38 London Road. SADC revoked two AQMAs in 2022 due to compliance for the last 5 years in NO_2 monitoring data and continued decreasing trends in concentrations across both AQMAs. The neighbouring DBC has declared three AQMAs with the closest (No. 1) approximately 4.8km south west, declared for exceedances of the annual mean NO_2 objectives. *Future Baseline* Air quality is generally expected to improve with time, due to more stringent emissions standards for motor vehicles and the uptake of cleaner vehicles. The future baseline conditions of the opening year of the Development will be defined using Defra background mapping and modelled as part of an ADMS roads dispersion modelling assessment.
Study Area
Construction Activities The study area for the construction dust risk assessment will consider the potential for impacts within 250m of the Site, and within 50m of the routes to be used by construction vehicles up to 250m from the Site entrances. These distances are defined in guidance provided by the Institute of Air Quality Management (IAQM)[33] guidance for assessing effects from demolition and construction activities. *Construction and Completed Development Traffic* The extent of the assessment of construction and operational traffic would be determined by the traffic data available, focusing on areas where the Development would lead to changes in Annual Average Daily Traffic (AADT) flows of more than 100 Heavy Duty Vehicles (HDVs) or 500 Light Duty Vehicles (LDVs) in accordance with the IAQM Guidance for construction phase assessment and assessing the potential effects on ecological designated sites[34]. For any roads where the traffic flows do not exceed these criteria, the potential for significant effects can be screened out of assessment.
Receptors
Receptors for the assessment will be sensitive receptors surrounding the Site boundary, and additional receptors located nearby road links where a potentially significant change in traffic is predicted. The majority of existing residential receptors are present to the west of the Site at the outskirts of Hemel Hempstead (at Woodhall Farm). Other residential properties are scattered in the

[32] Particular matter with an aerodynamic diameter of less than 10µm.
[33] IAQM, 2024. Guidance on the Assessment of Dust from Demolition and Construction (Version 2.2.). January 2024.
[34] IAQM, 2020. A Guide to the Assessment of Air Quality Impacts on Designated Nature Conservation Sites. Version 1.1. May 2020.

surrounds of the Site, including Little Revel End Farm, properties on Holtsmere End Lane and those off Hemel Hempstead Road (B487). A residential property is also located within the Site.
Ecological receptors considered in relation to road traffic emissions in the study area are limited to Local Wildlife Sites (LWSs) and Ancient Woodland (see Section 11 for more details).

Assessment Methodology

Baseline Characterisation Approach

Baseline conditions at the Site will be determined using local authority monitoring data and mapped background concentrations provided by Department for Environment Food and Rural Affairs (Defra)[35]. This will include a review of SADC's Air Quality Action Plan (2024)[36] including local monitoring data. It is noted that DBC is currently reviewing their Air Quality Action Plan for 2024-2029.
In addition, future air quality conditions in the study area would be determined using detailed dispersion modelling, as described below in 'Assessment Method'. Site specific monitoring is not required as the local authority monitoring data and Defra data is sufficient to predict on-site air quality concentrations.

Scoped In Effects

Construction
The Development has the potential to result in the following impacts during the construction stage which could lead to significant effects:

- The effects of construction of the Development on dust soiling and concentrations of PM_{10}; and
- The effects of construction traffic on concentrations of NO_2, PM_{10} and $PM_{2.5}$.

Completed Development
The completed Development has the potential to result in the following impacts which could lead to significant effects:

- The effects of operation of the Development on concentrations of NO_2, PM_{10} and $PM_{2.5}$ from road traffic emissions in the opening year.

Non-Significant Effects

The following impacts are not considered to lead to significant effects and consequently will be scoped out of the assessment:

- Construction plant emissions would not be modelled, in accordance with the IAQM guidance. Standard mitigation measures for construction plant will be included in the Outline CEMP, based on the advice included in the IAQM guidance, to ensure that effects are 'not significant'.
- The Development does not propose to include the use of on-site combustion plant to provide heat, hot water or electricity. As such, there are no centralised combustion plant included within the design that require assessment.
- It is not anticipated that any odorous materials will be excavated or used during the construction phase. No odourous uses are proposed within the completed Development and no odorous uses are close to the Site. Odour effects are therefore scoped out of the ES.

[35] Department for Environment, Food and Rural Affairs. Background Mapping Data for Local Authorities. Available at: https://uk-air.defra.gov.uk/data/laqm-background-home. Accessed: 28/01/2025.
[36] SADC, 2024. St Albans City and District Council – Air Quality Action Plan. Local Air Quality Management. February 2024.

Method
Construction The potential effects from dust generated from earthworks, construction and trackout at the Development would be considered using the approach presented in the IAQM guidance for assessing effects from demolition and construction activities. Consideration will be given to buildings within and immediately adjacent to the Site extent. The number of HDVs likely to be generated during the peak construction year will be considered in the context of the guidance from the IAQM and Environmental Protection UK (EPUK). Where the number of HDVs is greater than the relevant screening criterion (AADT flows of 100 HDVs) on roads with relevant exposure, the potential for impacts on concentrations of NO_2, PM_{10} and $PM_{2.5}$ at existing receptor locations would be modelled explicitly, following the approach below. This would be determined once construction traffic volumes are known. *Completed Development* <u>Human Receptors</u> The impacts of road traffic emissions would be predicted using the ADMS-Roads dispersion model. Further details of the ADMS-Road dispersion model will be provided and agreed with SADC in advance of modelling. The model requires a variety of inputs, including road traffic data (flows, speeds and vehicle fleet composition) and meteorological data. Road traffic data would be obtained from the Paramics traffic model as set out in Section 6. The traffic model would be used to predict pollutant concentrations for the following three scenarios: ▪ Baseline year - the latest available dataset; ▪ Future Baseline – Future Baseline (Baseline plus committed developments, including growth factors and cumulative schemes to be agreed with relevant authorities). ▪ Opening year with the Development, including traffic generated by relevant cumulative schemes and the Development itself. An important element of the modelling study would be to verify the model output against measured results. This would be undertaken by identifying suitable roadside air quality monitoring locations within SADC or DBC to verify pollutant concentrations. Meteorological data would be taken from a representative measurement site near to the Site. The year of meteorological data would be selected to match the baseline assessment year and the latest available monitoring data. Background pollutant concentrations would be determined using data derived from the background maps published by Defra. If possible, the background maps would be calibrated against suitable background monitoring sites near to the Site. <u>Ecological Receptors</u> A baseline study will be undertaken to identify the location of any ecological designations within 200m of a road link subject to changes in traffic flows as a result of the Development alone. If there are sensitive ecological receptors (i.e. ancient woodland, designated sites) within the relevant distance that are considered sensitive to changes in air quality, then the assessment would proceed to the next stage in discussion with the project's ecology team. This will be to determine if the predicted change in AADT flow on road links situated within the relevant distance of sensitive ecological receptors are as a result of the Development alone. If the AADT flow change is above 1,000 then further assessment maybe required. *Cumulative Effects*

The cumulative assessment will assess likely significant construction air quality effects around the Development, factoring in the influence of relevant cumulative schemes. The construction phase assessment will consider effects within 250m of the Site boundary and therefore cumulative schemes will be considered within 500m of the Site boundary.
Cumulative effects of the completed Development with other approved or planned development projects will inherently be incorporated into the Paramics model, from which the project transport consultant will provide traffic data for.

Assessment Criteria

The assessment criteria used to determine the significance of effects will be derived from the methodologies set out in:

- IAQM Guidance on the Assessment of Dust from Demolition and Construction document (2024);
- IAQM Land-Use Planning and Development Control: Planning for Air Quality (2017)[37]
- Environmental Protection UK guidance; and
- IAQM A Guide to the Assessment of Air Quality Impacts on Designated Nature Conservation Sites (2020)[38].

The assessment of potentially significant effects on sensitive receptors will consider the receptor sensitivity (on a scale of high, medium, low and negligible) and the magnitude of change (on a scale of high, medium, low and negligible) to determine significance (on a scale of major, moderate, minor and negligible). The assessment will aim to quantify impacts wherever possible. Where quantification is not possible, qualitative assessments will be used and justified. Effects that are judged to be major or moderate are considered to be significant.

Approach to Mitigation

Construction: Embedded mitigation includes a CEMP, which will be prepared and implemented to avoid or mitigate effects on the local residents and the community. Air quality and dust will be controlled through measures including dust minimisation measures. A Framework CTMP would also be developed which will include measures to control construction vehicle routing and manage traffic movements.
Completed Development: The mitigation for operational effects is likely to include design measures which reduce the need to travel and promote the use of sustainable modes of travel.

Assumptions and Limitations

For the assessment of road vehicle exhaust emissions, there may be uncertainties due to the complexities of pollutant dispersion and atmospheric chemistry. However, conservative estimates of emission magnitudes and their level of effect / significance will be produced as a number of robust assumptions will be incorporated into the model.

[37] IAQM, 2017. Land-Use Planning and Development Control: Planning for Air Quality. January 2017.
[38] IAQM, 2019. A Guide to the Assessment of Air Quality Impacts on Designated Nature Conservation Sites (Version 1.0) June 2019.

9 Noise and Vibration

Key Baseline Considerations
Existing Baseline A noise survey and noise mapping has been undertaken at the Site to inform the emerging masterplan for the Development. The existing baseline noise environment at the Site and in the surrounding area is dominated by road noise from the M1 motorway approximately 705m east and noise from Redbourn Road / Hemel Hempstead Road (B487) immediately to the south of the Site. There are no sources of vibration in the vicinity of the Site. To a lesser extent, there is noise associated with school pupils using the outdoor areas associated with the nearby Brockswood Primary School, supermarket service yard to the west of the Site and also noise associated with an electricity substation in the centre of the Site. *Future Baseline* Without the Development, future baseline noise levels are likely to experience a gradual increase over time, primarily due to growth in road traffic.
Study Area
The study area for the assessment of construction noise includes a number of existing residential dwellings which lie within 300m of the Site boundary based on guidance in BS5228-1[39]. The study area for the assessment of changes in traffic noise levels during the operation of the Development is determined from the roads on which there is an anticipated increase in traffic flow of a sufficient magnitude to result in a potentially significant noise effect. These links will be based on traffic data provided by the project's transport consultant and clearly stated in the ES.
Receptors
The receptors which have the potential to experience significant noise effects, and which will be considered within the assessment are as follows: ▪ Neighbouring existing residential properties which would experience construction noise and completed Development traffic noise, including a residential property within the Site at Great Revel End Farm and Tullochside Farm (traveller site) adjacent to the south eastern Site boundary; ▪ Brockswood Primary School to the west of the Site; ▪ Woodhall Farm Fields to the north west of the Site (amenity space); and ▪ Future noise sensitive receptors within the Development including residential properties.
Assessment Methodology
Baseline Characterisation Approach
A desk-based study to inform potential noise sources and noise sensitive receptors will be informed by a review of the following sources: ▪ Google Maps; and

[39] British Standards Institute (BSI), 2009. BS 5228-1:2009+A1:2014. Code of Practice for Noise and Vibration Control on Construction and Open Sites – Noise. January 2009.

- Streetmap.

A series of noise surveys on and surrounding the Site have been undertaken at the Site in November 2024 in the locations shown on Figure 9.1.

- Redbourn Road - road traffic noise survey;
- M1 motorway - road traffic noise survey (24hr weekday period);
- Commercial Noise Survey: A commercial noise survey has been completed for the existing electricity substation and service yard associated with the Sainsburys supermarket to the west of the Site;
- School Noise Survey: A noise survey for the school has been completed during a typical weekday period to measure noise from school pupil using the outdoor areas; and
- Background Noise Survey: A background sound survey has been completed on Site in the absence of any commercial sound.

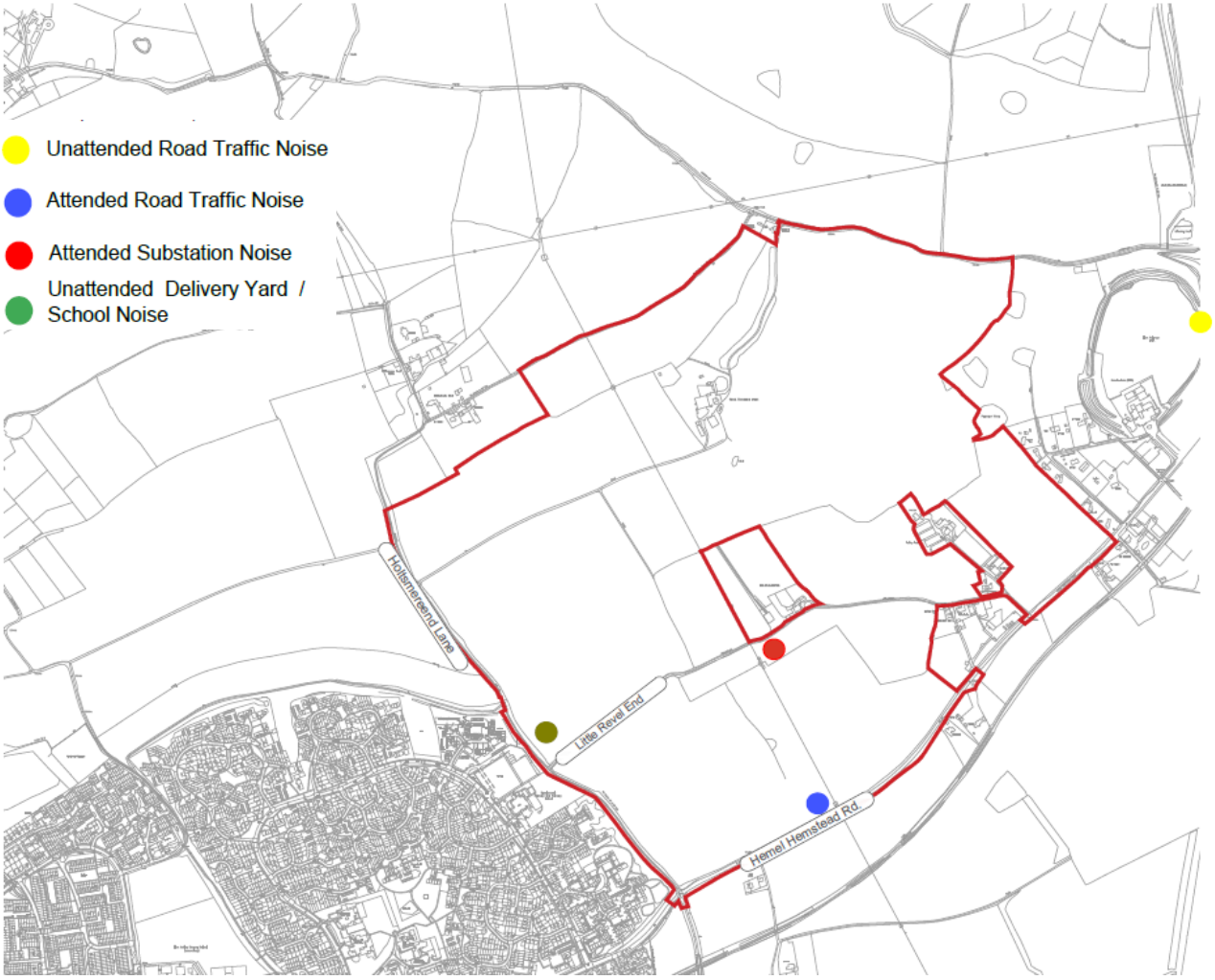
The noise surveys were completed during term-time and during weekday periods when noise impacts from the surrounding noise sources are at their highest. The noise surveys have also been undertaken during periods with suitable weather conditions.

All noise measurements have been carried out using sound level meters compliant with Type-1 specification, as set out in BS EN 61672-1:201340.

Vibration surveys are not proposed as no significant sources of vibration are identified.

[40] BSI, 2013. BS EN 61672-1:2013. Electroacoustics. Sound Level Meters – Specifications. December 2013.

Figure 9.1: Noise Monitoring Locations



Scoped In Effects

The Development has the potential to result in the following impacts which could lead to significant effects:

Construction:

- Noise and vibration effects from construction activities, including earthworks; and.
- Noise and vibration effects from construction traffic.

Completed Development:

- Noise effects to existing and future receptors from surrounding off-Site and on-Site commercial, educational and other uses; and
- Noise effects to existing and future receptors from road traffic movements, including those generated by the Development.

Non-Significant Effects

The Development uses will not introduce any new sources of vibration that could lead to significant effects on nearby receptors. An assessment of operational vibration from proposed new uses during the completed Development stage is scoped out of this assessment.

Method
Construction Construction noise will be assessed based on cautious worst-case assumptions in accordance with BS5228-1:2009+A1:2014. The focus will be on appropriate mitigation measures to be included in the Outline CEMP. Construction vibration during the construction phase will be assessed in accordance with the British Standard 5228-2:2009+A1:2014[41]. *Construction and Completed Development Traffic* Noise associated with changes in road traffic volumes on the existing road network due to traffic will be assessed following the principal assessment methodology detailed in Design Manual for Roads and Bridges (DMRB) (LA 111)[42]. The assessment methodology was developed for new roads but provides a reasonable robust methodology for assessing the change in traffic noise based on a comparison between the baseline and future conditions with the Development. The assessment would be based on peak construction traffic data and predicted traffic flows from the complete, fully occupied Development derived from the Paramics model. *Site Suitability* Site suitability for the proposed residential uses will be assessed in accordance with the NPPF, and the associated PPG and the Noise Policy Statement for England[43]. The Development will be designed in line with BS 8233:2014[44]. BS4142:2014[45] is the appropriate standard for assessing any commercial noise effects upon the closest proposed dwellings. Predicted noise effects at the proposed residential dwellings due to pupils at the adjacent school will be assessed against the existing ambient noise climate. *Cumulative Effects* Cumulative effects of road traffic noise with other approved or planned development projects are inherently incorporated into the Paramics model that the appointed transport consultant will provide traffic data from. The assessment of cumulative construction noise effects would be subject to the availability of information in the public domain to allow a meaningful assessment to be made.
Assessment Criteria
The assessment criteria used to determine the significance of effects will be derived from the methodologies set out in BS 5228-1, BS5228-2, BS8233:2014, BS4142:2014+A1:2019 and DMRB LA 111. These criteria have been successfully applied on many other development projects and are therefore not presented here. The assessment of potentially significant effects on sensitive receptors will consider the receptor sensitivity (on a scale of high, medium, low and negligible) and the magnitude of change (on a scale of high, medium, low and negligible) to determine significance (on a scale of major, moderate, minor and negligible). The assessment will aim to quantify impact where possible. Where

[41] BSI, 2009. BS 5228-2:2009+A1:2014 – Code of Practice for Noise and Vibration Control on Construction on Open Sites – Vibration. January 2009.
[42] Highways England, 2020. Design Manual for Roads and Bridges. LA 111 Noise and Vibration. Revision 2.
[43] DEFRA, 2010. Noise Policy Statement for England. March 2010.
[44] BSI, 2014. BS8233:2014. Guidance on Sound Insulation and Noise Reduction for Buildings. February 2014.
[45] BSI, 2019. BS 4142:2014+A1:2019. Methods for Rating and Assessing Industrial and Commercial Sound. June 2019.

quantification is not possible, qualitative assessments will be used and justified. Effects that are judged to be major or moderate are considered to be significant.

Approach to Mitigation

Construction

The Outline CEMP will include standard control and management measures to avoid or mitigate effects on local residents and the community. A Framework CTMP also include measures to control construction traffic routing and standard measures to minimise disruption associated with traffic.

Completed Development

The results of the baseline noise measurement survey and detailed noise modelling will be used to inform primary mitigation measures, such as the siting of new sensitive uses. An outline mitigation scheme, comprising design principles, will be developed as secondary mitigation to ensure that good acoustic conditions are achieved for both existing noise sensitive receptors and future noise sensitive uses within the Development. This may include the use of localised acoustic barriers in order to control noise in garden areas of residential dwellings and suitable glazing and alternative ventilation to permit satisfactory noise levels within internal habitable rooms.

This additional (secondary) mitigation will be developed as the design progresses, and will be appropriately considered at the assessment stage.

Assumptions and Limitations

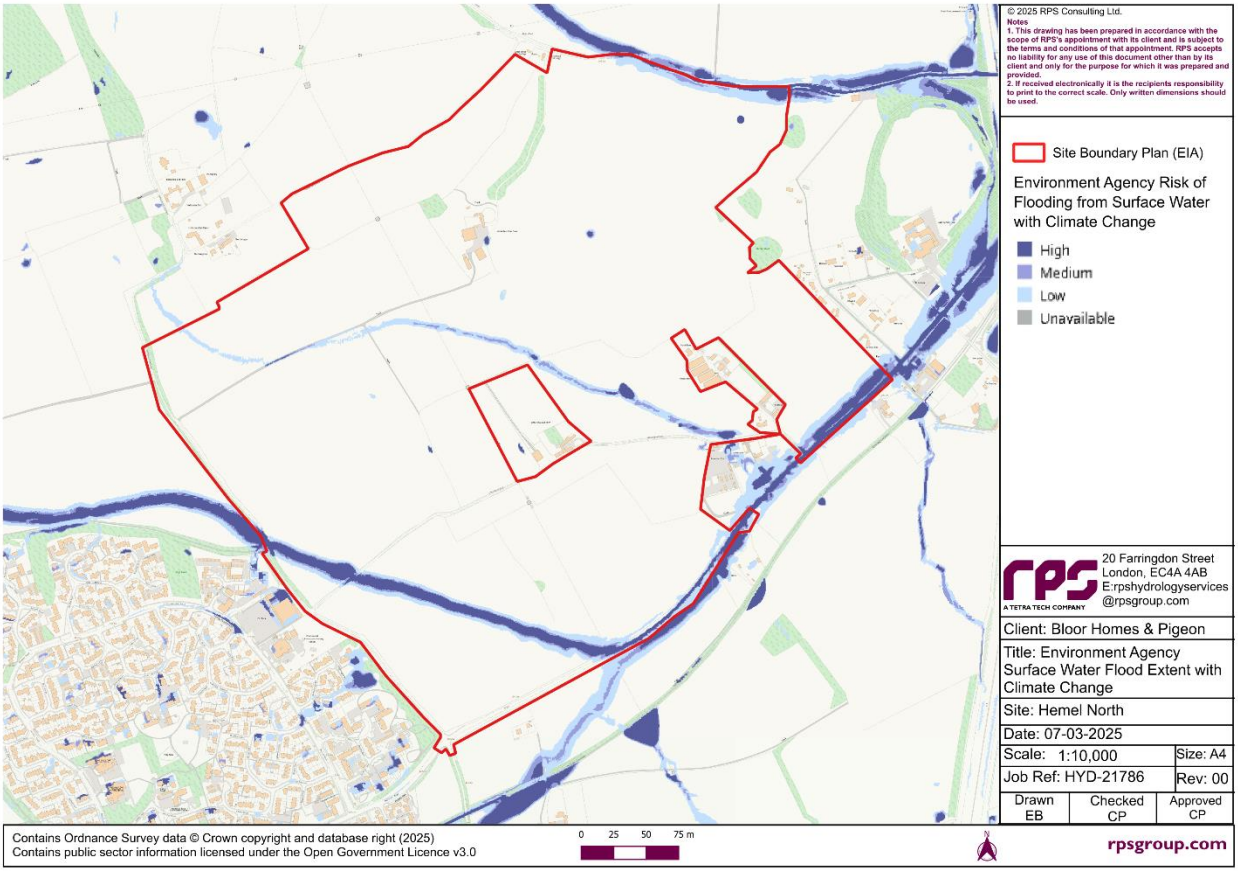
The following assumptions and limitations have been identified:

- Whilst basic information regarding construction activities will be supplied, worst-case assumptions will be made for plant items used during construction due to the outline nature of the application. Accordingly, the calculations performed will be accurate to a reasonable level based on knowledge of other urban re-development schemes completed in the past; and
- Given the outline nature of the proposed residential uses, no detailed layout is currently known at this stage and. As such, recommendations for mitigation will be made on potential layouts and general assumptions, as applicable.

10 Water Resources and Flood Risk

Key Baseline Considerations
Existing Baseline Existing Water Features and Drainage There are no surface water bodies within the Site boundary, the nearest being small ponds located approximately 750m and 900m to the east of the Site, beyond the M1. The nearest Main River, the River Ver, is located approximately 1.5km east of the Site. From the Environment Agency Catchment Data Explorer website, the Site is located within the River Ver waterbody catchment, and forms part of the River Thames river basin district. The Site is largely undeveloped, and comprises mainly agricultural fields, hedgerows and is therefore considered in largely 'greenfield'. The Site generally drains via natural infiltration. Periods of heavy rainfall creates temporary overland flow routes in lower valley areas. Flood Risk The Site is situated entirely within Flood Zone 1 (0.1% chance of annual flooding) for rivers and coastal flooding sources. EA flood mapping demonstrates a diagonal tranche of low to high surface water flooding risk (between 0.1% and 1% chance of annual flooding; to more than 3.3% chance of annual flooding) in the south western extent of the Site, associated with the topography of this area. A further area of low surface water flooding risk, with areas of medium (between 1% and 3.3% chance of annual flooding) and high flood risk transects the Site between the north west corner and central east border and Hemel Hempstead Road. These areas of surface water flood risk are associated with the topography of the Site rather than watercourses. This is presented in Figure 10.1. The risk of flooding from reservoirs is considered to be generally very low as per the EA 'Reservoir Flood Map'. The proximity to the Redbourn Reservoir to the west of the Site brings some localised risk of reservoir flooding to the southern part of the Site on Hemel Hempstead Road.

Figure 10.1: Preliminary Flood Model Extents



Hydrogeology

The Site is located within a Groundwater Source Protection Zone (Zone III) and a Drinking Water Safeguarded Zone for surface water (ID SWSGZ4016). The Site is not located within a drinking water protected area, a nitrate vulnerable zone or a drinking water safeguard zone for groundwater.

British Geological Society (BGS) mapping indicates that the Site lies atop of superficial deposits of Clay-with-flints Formation – clay, silt, sand and gravel and Head – Clay, silt, sand and gravel in the southeast underlain by a bedrock of Lewes nodular Chalk Formation and Seaford Chalk Formation - chalk. Defra mapping indicates the Chalk bedrock is principal aquifer and has a medium to high groundwater vulnerability risk level.

Water Supply and Wastewater

Affinity Water advised in relation to the Local Plan Infrastructure Delivery Plan that major reinforcements (pipelines and pumping stations) will be required to service the planned growth at Hemel Hempstead, but there is sufficient water supply in the region. New infrastructure is understood to be available for initial phases of growth.

Future Baseline

In the absence of the Development, the baseline conditions within the Site are expected to remain relatively constant in the future. However, climate change could result in increases in the frequency and intensity of rainfall events and therefore increased severity of flood events. Demand for potable water is also likely to increase in the future as a consequence of climate change and growth.

Study Area

The study area for the assessment of flood risk and drainage will encompass the Site and the associated downstream water features likely to be affected by the Development. The study area will cover 1km from the Site as this represents the hydrological zone of influence. Receptors will also include below ground receptors including groundwater bodies.

Receptors

- Construction site workers and future properties and users of the Development (in relation to flood risk);
- Off-site areas and properties (in relation to flood risk from all sources)
- Local watercourse network;
- Surface water bodies;
- Groundwater bodies;
- Foul sewerage and potable water network; and
- Regional water resources.

Assessment Methodology

Baseline Characterisation Approach

Initial baseline studies have already been undertaken including hydraulic modelling of parts of the Site as part of the Applicant's representations to the Local Plan process. Drainage infiltration testing and groundwater monitoring was also undertaken at the Site in July 2019 to inform the drainage strategy. Baseline conditions in the study area would be characterised using a combination of the following data sources:

- Existing Site information, topographical data, asset reports and consultation with the LLFA, EA, Thames Water and Affinity Water (statutory undertakers for foul water and water supply respectively);
- Ordnance Survey, aerial and historic maps;
- Envirocheck™ Report and desk based assessment of ground conditions;
- Flood maps, historic records of floods, published data on flooding, water quality, water resources, hydrological, climate, geology and soils;
- Citations and data on nearby nature conservation designated sites;
- Current River Basin Management Plans, Catchment Abstraction Management Strategies, and SADC Strategic Flood Risk Assessments covering the Site; and
- Water quality, water resource, pollution incident, fisheries and aquatic ecology data from the EA.

As stated above, surface water hydraulic modelling of the Site has already been undertaken to understand the maximum extent of surface water flood risk. This was undertaken in 2019 and will be updated in consultation with the LLFA and EA to reflect the latest EA climate change allowances and latest rainfall data.

Scoped In Effects

Construction

- Effects on water quality of water bodies including local watercourse network and groundwater; and
- Localised effects on groundwater flow and stream base flow, including groundwater flooding.

Completed Development

- Flood risk – changes in flood risk from all sources (factoring in climate change allowances and the latest rainfall data), including changes to topography as appropriate;
- Groundwater – potential changes in hydrogeology and the flow of groundwater beneath the Site resulting from the completed Development;
- Surface water (quantity) – the effects of the completed Development on the volume and rate of surface water runoff taking account of the proposed ground level and sustainable drainage systems;
- Surface water (quality) – the potential risk of the completed Development resulting in pollutants and their effects on the water environment.
- Foul water – additional demand for foul water treatment and networks from the completed Development, including any potential infrastructure capacity issues.
- Potable water – demand on potable water supply resulting from the completed Development, including water resource availability and management.

Non-Significant Effects

Construction

- Potential changes in rate and volumes of surface water runoff and demand and supply of the local drainage and water supply network – these would be effectively mitigated through standard good practice site measures outlined within the Outline CEMP.

Completed Development

- Risks to groundwater quality from the completed Development are not considered likely due to the nature of the proposals.

Method

Construction and Completed Development

The ES Chapter will be informed by a Flood Risk Assessment (FRA) which will be prepared in accordance with LLFA, NPPF and EA requirements. The assessment related to flood risk for the EIA will draw upon the studies and conclusions made within the FRA.

Further consultation will be undertaken with the LLFA and the EA to inform the development design and scope of the assessment.

The assessment will be based on existing water quality and flow data provided by the EA and LLFA. Hydraulic modelling of the Site will be undertaken to ascertain the nature of the surface water on-Site. A baseline model will be undertaken and following refinement of the masterplan, and proposed design scenarios will be modelled to understand the impact the Development may have on the surface water.

Future baseline conditions will be predicted, taking into account the likely impacts of climate change on river flows and flood levels.

With reference to the Simple Index Approach described in the Sustainable Drainage Strategy (SuDS) Manual[46] the approach to SuDS treatment measures will be defined. The principles of surface water drainage for the Development will be described in Surface Water Drainage Strategy which will form part of the FRA and will be summarised in the ES chapter.

The assessment will report on the outcome of consultation with the EA, SADC, HCC, Thames Water and Affinity Water and undertake a qualitative assessment of the disposal of foul water

[46] CIRIA, 2015. The SUDS Manual (C753). 2015

from the Development. The assessment will also describe consultation with Thames Water regarding water supply and how the Development seeks to minimise future water consumption, in accordance with planning policy and the regional Surface Water Management Plan[47].
Under this approach, the importance of the receptor and the magnitude of impact are determined independently from each other and are then used to determine the overall significance of effects. Where significant adverse effects are predicted, options for mitigation will be considered and secured where possible.
With reference to best practice (e.g. CIRIA guides) mitigation measures will be identified to manage and control works during construction.
The potential impact on surface water quality from new urban runoff will influence the type of drainage systems considered. Preference will be given to the use of filtration type SuDS wherever practicable in accordance with the SuDS hierarchy set out in Building Regulations, although the viability of these methods will be carefully considered against site specific conditions. Features will be incorporated into the drainage strategy and designed to mitigate against the potential for pollution of surface water. SuDS can also be used to limit the impact of the Development on flood risk by reducing the rate at which runoff from new hard areas discharges into receiving watercourses.
Cumulative Assessment
The cumulative assessment will assess likely significant demolition and construction water resources and flood risk effects around the Development, factoring in the influence of relevant cumulative schemes which are situated within approximately a 1km radius of the Site boundary. Due to the scale of the Site and Development, cumulative schemes beyond the 1km radius are too far from the Site to result in any cumulative effect and will therefore be excluded from the assessment, although a qualitative assessment would be made in relation to water resources.

Assessment Criteria

The assessment criteria used to determine the significance of effects will be derived from the methodologies set out in LA 104 - Environmental assessment and monitoring (Design Manual for Roads and Bridges (DMRB), 2020).
The assessment of potentially significant effects on sensitive receptors will consider the receptor sensitivity (on a scale of high, medium, low and negligible) and the magnitude of change (on a scale of high, medium, low and negligible) to determine significance (on a scale of major, moderate, minor and negligible). The assessment will aim to quantify impact where possible. Where quantification is not possible, qualitative assessments will be used and justified. Effects that are judged to be major or moderate are considered to be significant.

Approach to Mitigation

Construction
The Outline CEMP will include standard measures to avoid the mobilisation of sediments and contaminants ensuring protection of surface and groundwater. Groundwater and water quality mitigation will include adoption of best practice guidance including that set out in the DMRB, guidance from the CIRIA and guidance provided in Environment Agency Guidance for Pollution Prevention (GPP) documents.
Completed Development

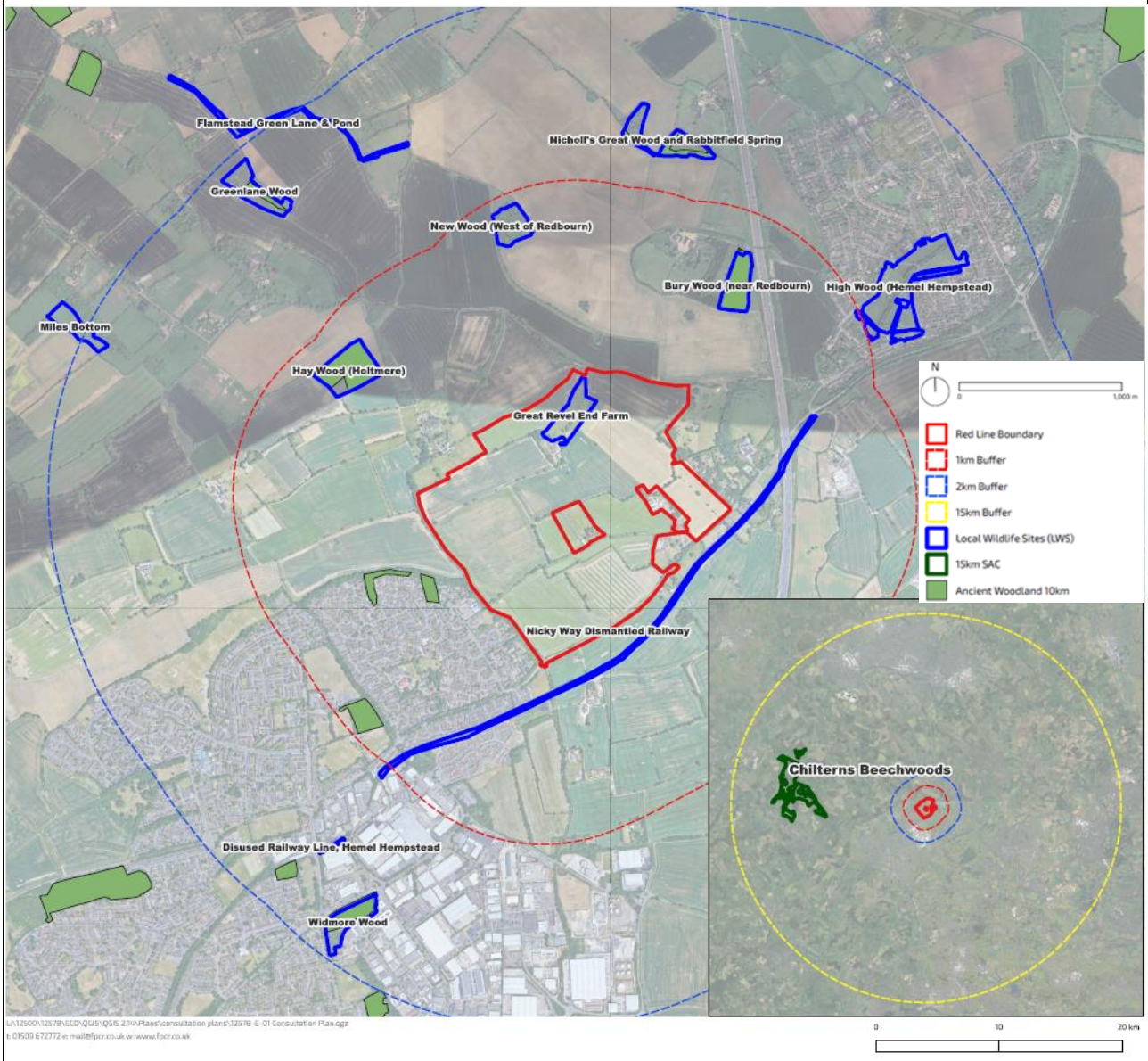
[47] HCC, 2021. Hertsmere Borough Surface Water Management Plan Final Report. March 2021.

Surface water hydraulic modelling will provide Site-specific information on the extent of surface water flood risk. Appropriate primary mitigation will likely include siting development outwith areas of medium and high surface water flood risk where possible. A surface water drainage strategy will be developed in line with national and local policy guidance including guidance from the LLFA. The discharge rate from the Development is likely to be restricted to the greenfield runoff rate and maximising infiltration where possible.
Assumptions and Limitations
Reasonable worst-case assumptions would be made in relation to the siting of uses and extent of impermeable areas.

11 Biodiversity

Key Baseline Considerations
Existing Baseline Baseline ecology surveys have been undertaken at the Site between 2023 and 2025 to inform the emerging masterplan. <u>Designated Sites</u> One internationally designated site is located within 15km of the Site. Chilterns Beechwoods Special Area of Conservation (SAC) is located approximately 8km west of the Site (at its closest point). This Site is primarily designated due to the extensive area of *Asperulo-Fagetum* beech forests it supports, in the centre of the habitat's UK range. The SAC supports an important part of a grassland-scrub-woodland mosaic and also supports stag beetle *Lucanus cervus*. There are no statutory designated sites of national conservation value, such as SSSIs, within 2km of the Site boundary. There are several Local Wildlife Sites (LWS) within the 1km search area. The closest of which is Great Revel End Farm within is within the northern part of the Site. High Wood LWS is located to the south west of the Site. A number of areas of Ancient Woodland (some also located within LWSs) are allocated within the study area and in proximity to some major roads. Figure 11.1 shows the designated sites within the search area.

Figure 11.1: Designated Sites Map



Habitats

The majority of the Site comprises large arable field compartments bound by hedgerows. Floral diversity is low due to the intensive agricultural management practices and the input of fertiliser, pesticide and herbicide.

A large expanse of improved grassland is present on the east of the Site, managed by annual cutting and dominated by perennial rye-grass. A small area of semi-improved grassland is also present within the northwest corner of the southern field compartment.

Woodland habitats are of limited extent on-Site with no areas of ancient woodland. The western edge of the southern field compartment is bound to the west by broadleaved woodland, which extended off-site beyond Holtsmere End Lane. A narrow strip of woodland extends from north to south into the southern field compartment.

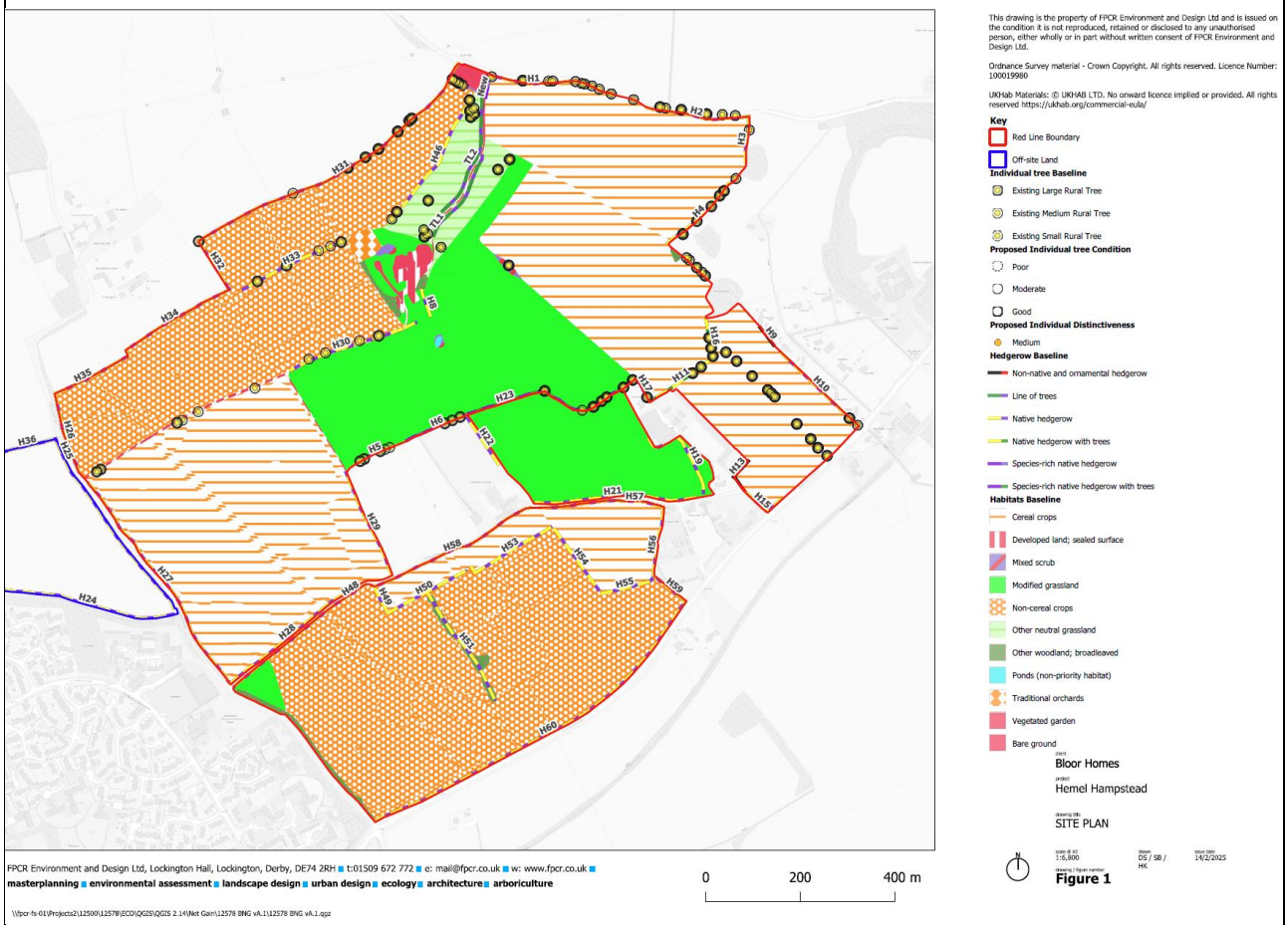
A single small pond was present within the centre of the Site adjacent to a pocket of mixed scrub which caused heavy shading of the pond. Water levels were low during the Site visit in June 2024, with the water quality appearing poor and no aquatic plants present.

Individual trees are mainly located within the boundary hedgerows, with additional trees scattered within the other neutral grassland. There are no Tree Preservation Orders on or adjacent to the Site.

The Site is bound and divided by numerous native hedgerows which are considered to be Habitats of Principal Importance (HPI).

Figure 11.2 presents the habitats currently present at the Site.

Figure 11.2: On-Site Habitat Map



Protected Species

Bat surveys indicate that that the Site is used by common and widespread species of bat including common pipistrelle, soprano pipistrelle and noctule, for commuting and foraging. Lower numbers of more rare bat species including barbastelle (Annexe II species), Nathusius' pipistrelle and serotine were recorded using the habitats on-Site for foraging and commuting. Numerous trees on Site were considered to have suitability to support roosting bats, aerial assessments are being completed in the 2025 bat active season. No impacts to farm buildings are expected from the Development so they have not been surveyed for potential to support roosting bats.

Badgers are known to use the Site with evidence of setts.

A variety of common and widespread bird species have been recorded during breeding and wintering bird surveys on-Site, along with some more notable farmland species. The species recorded are all consistent with the habitats on-site, mainly arable land with associated hedgerows and field margins. A large proportion of the species recorded have been generalist species. A number of farmland birds were recorded utilising the habitats on-site including linnet,

skylark and yellowhammer. Birds of prey have also been recorded, including red kite, kestrel and buzzard.
Due to the lack of records and available survey evidence, great crested newts, otter, water vole, hazel dormice and reptiles are considered likely absent from Site.
Future Baseline
In the absence of development, the Site would likely remain greenfield and support a similar range of habitats. If farming practices were to continue, it is likely that the Site would continue to support badgers, generalist and farmland birds, common and widespread bat species and rare bat species in low numbers. It is unlikely that great crested newt and hazel dormice would colonise the Site unless management practices were to change. If reptiles were to colonise the Site, it is likely that they would be restricted to the hedgerows and field boundaries.

Study Area

The Site has been subject to ecology surveys between 2023 to 2025 and surveys are ongoing. The search areas for biodiversity baseline information from the Site are as follows:

- 15km for sites of international importance (SACs, Special Protection Areas (SPAs), Ramsar sites);
- 2km for sites of national or regional importance (National Nature Reserves, SSSIs); and
- 1km for sites of County importance (LWS and species records (e.g. protected, Local Biodiversity Action Plan (LBAP) or notable species).

Key Receptors

The receptors which have the potential to experience significant biodiversity effects, and which will be considered within the assessment are as follows:

- Chilterns Beechwoods SAC (potential ecological receptors to be considered for air quality and recreational effects);
- Great Revel End Farm LWS;
- Ancient woodlands;
- Priority Hedgerows;
- Bats (roosts (if present), foraging and commuting habitat);
- Badgers;
- Wintering Birds; and
- Breeding Birds.

Assessment Methodology

Baseline Characterisation Approach

Baseline conditions in the study area have been and will be determined using a combination of the following data sources and surveys:

- Habitat surveys (April 2023 and June 2024);
- Badgers (April 2023 and April to May 2024);
- Bats: Tree assessments (April 2023 and January 2025), activity transect and remote detector surveys (April to October 2023);
- Breeding Birds (April to June 2023);
- Great Crested Newt (Habitat Suitability Index and eDNA sampling) (April 2023 (on-site and wider survey area ponds) and April 2024 (off-site ponds);
- Common Reptile (April to October 2023);

- Dormouse (April to November 2023);
- Biodiversity net gain habitat condition assessment (June 2024).

Scoped In Effects

Construction

- Effects on designated sites and protected / notable habitats as a result of construction activity, including habitat loss, loss of ecological connectivity, emissions (e.g. dust);
- Effects on habitats as a result of construction activity (e.g. habitat loss, severance, pollution) and construction traffic (e.g. noise and air emissions);
- Effect on protected and notable species as a result of construction activity (e.g. due to habitat loss, noise/dust/light emissions, disturbance, displacement of species, spread of invasive species).

Completed Development

- Effects on designated sites and ancient woodland from air quality emissions from Development-generated traffic;
- Recreational disturbance effects to Chilterns Beechwoods SAC and/or Great Revel End LWS due to resident population;
- Degradation of retained and created habitats from activities associated with the completed Development;
- Disturbance effects to faunal species / populations from unintentional mismanagement, timing of management works; and
- Disturbance effects to faunal species / populations from the creation of new habitats; and
- Disturbance effects (including lighting and noise) on protected / notable species.

Non-Significant Effects

The following impacts are not considered to lead to significant effects and consequently will be scoped out of the assessment:

- Effects on SPAs, Ramsar, NNRs and SSSIs on account of their spatial separation and distance from the Site;
- Loss of habitats of low value to biodiversity including arable cropland, developed land, bare ground and improved grassland (poor condition);
- Great Crested Newts, hazel dormice, reptiles due to likely absence recorded during surveys; and
- Otters and water voles due to lack of suitable habitats.

Method

Construction and Completed Development

Ecological survey work is undertaken in accordance with current best practice guidelines at that time. The scope of the surveys will be agreed with HCC Ecology.

The methodology for the Ecological Impact Assessment (EcIA) and ES Chapter will follow relevant guidance and assessment criteria issued by the Chartered Institute of Ecology and Environmental Management (CIEEM)[48] (the 'CIEEM Guidance'). This is the current industry

[48] CIEEM. September 2024. Guidelines for Ecological Impact Assessment in the UK and Ireland (EcIA). Version 1.3.

guidance for ecological assessment. It is not considered to be prescriptive but provides guidance to practitioners for refining their own methodologies.

The impact assessment process involves:

- Identifying the importance / sensitivity of a feature;
- Identifying and characterising impacts on species / habitats;
- Incorporating measures to avoid and reduce (mitigate) these impacts as part of an iterative design process;
- Assessing the significance of any likely residual effects after mitigation;
- Identifying appropriate compensation measures to address significant residual effects; and
- Identifying opportunities for ecological enhancement.

The assessment would describe those impacts that are relevant to understanding the significant ecological effects and determining their significance. The CIEEM Guidance describes the concept of ecological significance and how this relates to the ability to deliver biodiversity conservation objectives for a given feature.

The assessment would be informed by Parameter Plans and secured design principles relating to vegetation loss/habitat creation, lighting and drainage. An Outline Landscape and Ecological Management Plan (LEMP) would be prepared and submitted with the planning application that would set out the principles that would be adopted to ensure the protection and enhancement of the ecology and biodiversity, on and around the Site.

The assessment would include an assessment of BNG which would be undertaken in accordance with the latest Statutory Metric and associated guidance documents. The Development would seek to achieve net gains in biodiversity through on-site measures alone. On-site measures will include consideration of the enhancement of retained habitats such as the woodland, grassland, hedgerows and the establishment of new habitats.

A Habitats Management & Monitoring Plan would be provided post-planning, which would include prescriptions for retained/enhanced/created habitats outlined within the BNG assessment to reach their target conditions, in order to achieve a gain of at least 10% on-Site.

Cumulative Effects

The cumulative assessment will assess likely significant effects of the development both alone and in-combination with development schemes within proximity to the Site.

The approach to the in-combination assessment for the Shadow HRA would be agreed with SADC and Natural England. Cumulative effects of the completed Development with other approved or planned development projects would be taken into account in the road traffic data provided by the project transport consultants, to provide an in-combination assessment of potential air quality effects upon the Chilterns Beechwoods SAC.

Habitats Regulations Assessment – An HRA has been undertaken for the Regulations 19 Local Plan by AECOM (dated September 2024). A single realistic impact pathway for recreational pressures (in combination) on Chilterns Beechwoods. The Draft Local Plan therefore identifies the need for mitigation to ensure that no adverse effects upon the SAC result from the Development (in combination). A recreational Zone of Influence (ZoI) of 12.6km around the SAC covers part of St Albans District, and SADC cannot issue decisions within the recreational ZoI until appropriate mitigation is secured through a Mitigation Strategy. The Mitigation Strategy comprises of two elements, a Strategic Access Management and Monitoring Strategy (SAMMS) and SANG strategy. The HRA concludes that *'It is considered that with the SAC Mitigation Strategy in place, and the Council's confidence to deliver SANG in a timely fashion,*

(acknowledging the excess SANG capacity at Hemel Garden Communities), that no adverse effects on the integrity of the Chilterns Beechwoods SAC would result.'

The Development will deliver a significant area of SANG. Nonetheless, the planning application would be accompanied by a Shadow HRA to inform SADC's own Appropriate Assessment of the planning application. The approach to and scope of the Shadow HRA would be agreed with SADC and Natural England, both in respect of recreational pressures and impacts from road traffic emissions (if relevant) discussed above.

Assessment Criteria

The assessment of significant ecological effects would be undertaken in accordance with the CIEEM Guidance:

- Establish Baseline & Future Baseline – this is based on desk study, field surveys and management practices which describes the existing and potential Important Ecological Features (IEFs) within the zones of influence specified.
- Determine the Scale of Importance of Ecological Features – importance is determined using geographical frames of reference: Site, Local, Country, Regional, National and International. This assessment is based on a variety of factors, including statutory protection, statutory designation, conservation status, abundance and rarity.
- Assess Significant Ecological Effects – based on the importance of the ecological feature, magnitude of the impact and sensitivity of the features considered. This is description-based rather than applying a matrix which considers construction and operation effects only where relevant and is therefore based on professional judgement. The assessment assumes the proposed layout, intrinsic mitigation and routine ecological mitigation normally conditioned are in place, and these would be outlined clearly.
- Mitigation – This will be based on the mitigation hierarchy: avoidance, mitigation, compensation and enhancement. Any further mitigation measures required will be outlined to ensure residual effects are lowered to a level considered acceptable. Enhancements will seek BNG in line with the NPPF and local policy.
- Residual Effects – final conclusionary statements for the short, medium and long-term.

Approach to Mitigation

At this stage, mitigation is likely to include (but not be limited to):

Construction

- Avoidance of designated sites, areas of recognised habitat value or areas supporting protected species, where practicable;
- Protection of habitats during construction activities from pollution/ disturbance etc. through standard measures secured through the Outline CEMP; and
- Appropriate buffer zones for projected species including badger and Schedule 1 bird species (including red kite) to avoid disturbance during construction work.

Completed Development

- Replacement habitat for that lost where such habitat is either of conservation significance in its own right or supports a protected or otherwise notable species. These include broadleaved woodland, ponds, mixed scrub and individual trees;
- Retention and enhancement of hedgerows and boundary features of the Site wherever possible;

- Maintenance of dark corridors across the Site to ensure the continued use of the Site by light-sensitive species, bat species.
- Provision of a suitable and sufficient area of SANG. The design principles for the SANG will be developed in consultation with SADC and Natural England with reference to 'Guidelines for Creation of Suitable Alternative Natural Greenspace' (SANG) (Natural England, August 2021)[49]. The purpose of the SANG is to provide alternative green space to divert visitors from the Development visiting the Chilterns Beechwoods SAC. The SANG will be designed to provide avoidance measures for the potential recreational impact of residential development on the SAC; this may be phased by occupation. A SANG Management Plan will be committed to by the Applicant that ensures management of the SANG in perpetuity, to be secured by planning condition;
- Habitat creation as part of the SANG and BNG provision, including native shrubs/scrub, native woodland, ponds, SUDS, meadow grassland, hedgerows and trees;
- Inclusion of open, species rich grassland within the SANG and other green infrastructure, including provision of suitable skylark habitat; and
- Inclusion of mixed scrub rich at grassland edges, for farmland birds including linnet.

Assumptions and Limitations

The following assumptions and limitations have been identified:

- Since some of the surveys have been completed (bat activity transect surveys and static detector surveys), updated survey guidelines were published by the Bat Conservation Trust (BCT)[50] in September 2023 which include an update to the whole suite of survey recommendations. Despite this, CIEEM recommend that for the purpose of informing planning applications, ecological survey data is typically valid for a period of two-three years assuming that habitats on a potential development site have not changed to a degree which could impact previous survey results. An updated walkover of the Site was completed in June 2024 which confirmed that habitats have not significantly changed and therefore the survey results are still considered to be valid to support a planning application in 2025. Surveys undertaken following publication of the new BCT guidelines (i.e. tree assessments) were updated to the 2023 Guidelines.

[49] Natural England, 2021. Guidelines for Creation of Suitable Alternative Natural Greenspace' (SANG). August 2021.
[50] BCT. October 2023. Bat surveys for Professional Ecologists – Good Practice Guidelines.

12 Agricultural Land and Soils

Key Baseline Considerations

Existing Baseline

The Site comprised predominantly farmland in arable cropping and constitutes two farmholdings. The Site is shown on the 'provisional' Agricultural Land Classification (ALC) maps[51], published at 1:250,000 scale, as undifferentiated Grade 3 which is good to moderate quality. The Site is shown on the 'Likelihood of BMV' maps by Natural England (2017)[52] as falling into the moderate likelihood of containing Best and Most Versatile (BMV) land, being 20 – 60% of land by area being BMV. Similar likelihood land surrounds most of Hemel Hempstead.

The southern parcel of the Site has been surveyed in the past by the Ministry for Agriculture, Fisheries and Food (MAFF) as part of the SADC Local Plan which was developed in 1996. Additionally, most of the land to the east of Hemel Hempstead was surveyed. The northern part of the Site was subject to a survey in February 2025.

The surveyed area within the Site comprised a majority of ALC Subgrade 3b moderate quality, with areas of Subgrade 3a good quality and an area of Grade 2 high quality BMV land in the south western area of the Site.

Future Baseline

Without the Development it is likely that the land will continue to be farmed or used for agri-environmental uses.

Study Area

The study area is the Site extent.

Receptors

The ES chapter will consider the potential effect on the following receptors:

- Agricultural land for biomass production, as measured under the ALC;
- Soils as a physical resource; and
- Occupying farm businesses.

Planning policy requires that land of BMV quality be recognised in terms of its economic and other benefits. Nationally, BMV accounts for about 42% of agricultural land[53]. Nationally this amounts to the order of 3.7 million ha of BMV in active agricultural use. As this is identified for recognition in the NPPF, land of BMV quality is identified as a receptor of high sensitivity of national significance.

Soils can be adversely affected by being handled and moved in unsuitable conditions. High clay soils are the least resilient and sandy soils the most resilient to being handled. The MAFF ALC (1996) found high clay soils. In this dry part of the country even high clay soils are unlikely to be of more than moderate sensitivity, and of local significance.

Farm businesses are resilient to change and only enterprises for which the particular location of land is especially important (e.g. dairy farms with access to grazing land) are considered to be

[51] https://publications.naturalengland.org.uk/category/5954148537204736
[52] https://publications.naturalengland.org.uk/category/5208993007403008
[53] Natural England, Technical Information Note TIN049, December 2012

particularly sensitive to change. On the Site, most farm businesses are likely to be of low sensitivity and of local significance only.

Assessment Methodology

Baseline Characterisation Approach

The assessment will be informed by:

- Available survey results, including MAFF (1996);
- Detailed ALC field survey of all land subject to development not previously surveyed which was completed by Kernon Countryside Ltd in January 2025 using standard ALC methods; and
- Farm interviews with key affected landowners and site survey as required.

Scoped In Effects

Construction

- Loss by sealing or irreversible downgrading of BMV quality agricultural land;
- Reduction or damage to the structure of soils that are sensitive to being damaged if handled when unsuitably wet; and
- Reduction in farmable land areas affecting farm operations and viability. Related economic and food production impacts.

Non-Significant Effects

The following effects are not likely to be significant and are therefore scoped out:

- Effects on field drainage of surrounding agricultural land; and
- Effects from the completed Development (all significant effects will likely occur at the construction phase).

Approach to Mitigation

Construction

The Outline CEMP will include standard good practice measures to protect soil resources, general principles of soil handling and working methods. This will require a detailed Soil Management Plan to be developed prior to construction, tailored to specific soil types at the Site, for the handling, storage and reinstatement of soil.

Completed Development

Where possible, the Development will retain BMV and use areas of poorer quality land over those of higher quality for built development. The approach to mitigation will be tailored to respond to the results of the soil and ALC surveys. In so far as possible and in combination with other considerations, soil of BMV quality will be retained for use within the Site. The green infrastructure strategy would also include green spaces within new Development with retained soil resources. The Development would be designed to protect the quality of retained BMV, e.g. avoiding compaction or erosion from flooding.

Assumptions and Limitations

None identified.

13 Cultural Heritage

13.1 This section is accompanied by Appendix 13.1: Archaeology Desk Based Assessment and Appendix 13.2: Heritage Statement.

Key Baseline Considerations

Existing Baseline

A desk-based study and visit of the Site has been undertaken by RPS. The Heritage Impact Assessment (September 2024) undertaken to inform the Regulation 19 Local Plan has also been reviewed which includes an assessment of the North Hemel Broad Location by Place Services and SADC.

Built Heritage

The Site boundary includes a single designated heritage asset: the Grade II Listed Great Revel End Farm (NHLE 1102957). In addition, the following Grade II Listed Buildings lie close the Site: Wood End Farm Cottages (NHLE Ref. 1102907), to the south of Hemel Hempstead Road; and Holtsmere Manor to the north of Holtsmere End Lane. In addition, a probable non-designated heritage asset, Little Revel End Farmhouse (HER ref. 18758), is outside the Site boundary but located in the centre of the Site.

The Aubreys Camp Scheduled Monument is located approximately 250m south east of the Site. Redbourn Conservation Area is located approximately 720m to the east of the Site (on the eastern side of the M1 motorway).

Figure 13.1 shows the location of designated heritage assets within 1km of the Site boundary.

Archaeology

There are no designated heritage assets located within the Site. One Scheduled Monument, Aubreys Camp a defensive enclosure likely dating to the Iron Age, is located c.250m to the north-east, below the Site in the bottom of a valley. There is no clear intervisibility between the Site and the Scheduled Monument, which is surrounded by dense planting. The valley location of the Monument evidences the fact that the Site has not historically made a positive contribution to the Monument's significance, a fact reinforced by the lack of any obviously Iron Age/Roman settlement remains identified on the geophysical survey undertaken across the Site.

There are eight HER entries within the Site. One relates to cropmarks of field boundaries (likely to be post- Medieval or later in date), with the remainder consisting of surface finds dating from the Late Iron Age to Modern period (including a late Bronze Age socketed axe). Geophysical surveys of the Site (2019 and 2025) have identified very few anomalies of obvious archaeological interest relative to the size of the Site. These comprise a probable Post Medieval structure within the south-western area, a number of short ditch lengths of unclear date; Post Medieval to Modern quarry pits and a set of World War II camp huts. There are no obvious archaeological constraints to the proposed Development of the Site.

Future Baseline

Built Heritage

Continued landscape change, through loss of or changes to hedgerows, changes in land tenure, and alterations (minor or major) to neighbouring properties may see a continued evolution of the Site's landscape character, and loss of traditional or historical features.

Archaeology

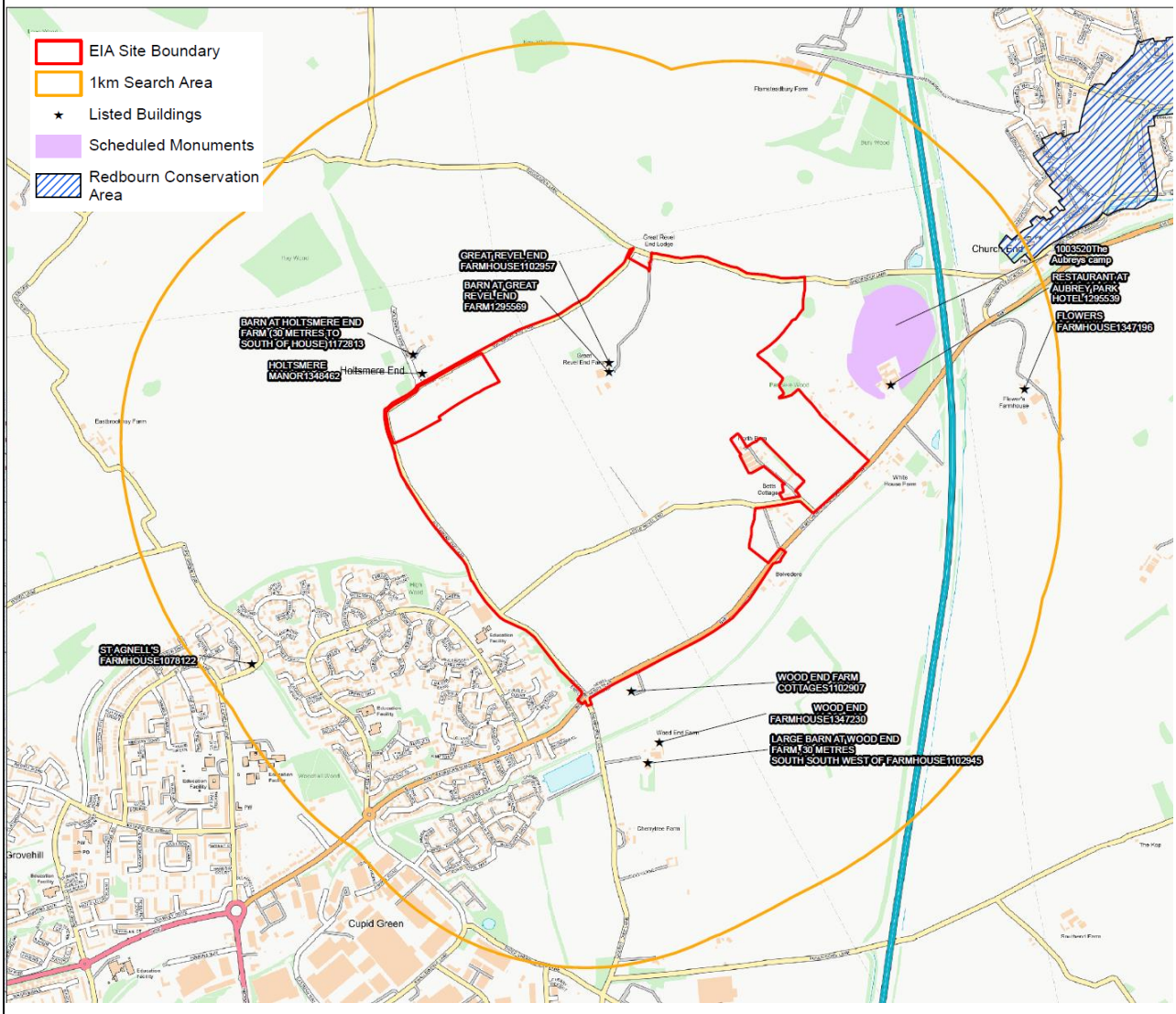
Assuming the Site remains as agricultural land with limited activity, the future baseline for buried archaeology will remain broadly unchanged, although it is possible that deeper ploughing will in the future will further denude buried archaeology which may be present.

Study Area

Based on previous assessments of the Site, historical research, and a Site visit, a 1km search radius has been used to identify designated heritage assets (e.g. scheduled monuments, Grade I, II* and II listed buildings, Grade I, II*, and II registered parks and gardens, registered battlefields, and conservation areas) and non-designated heritage assets that may be affected by the Development.

There is no evidence (arising from research or the Site visit) for any meaningful visual, historical, spatial, thematic, or other associations between any heritage assets beyond the study area which might contribute to their significance, and they are thereby scoped out.

Figure 12.1: Cultural Heritage Receptors



Receptors

Built Heritage

The following receptors are considered sensitive to potential likely significant effects arising from the Development (see Figure 13.1):

- Aubrey Camp Scheduled Monument (NHLE 1003520), located 250m southeast of the Site;
- Holtsmere Manor, Grade II listed building (NHLE 1348462), located 140m north of the Site;
- Great Revel End Farmhouse Grade II listed building (NHLE 1102957), located within the Site;
- Wood End Farm Cottages and Wood End Farmhouse, Grade II listed buildings (NHLE 1102907 and 1347230), located within 70m and 300m south of the Site; and
- Little Revel End Farm, non-designated heritage asset (HER ref. 18758) (located outwith the Site boundary in the centre of the Site).

It should be noted that the Grade II listed Barn at Great Revel End Farm (NHLE 1295569) is not taken forward for assessment as at the time of the Site visit it had been cleared. Nevertheless, it remains on the National Heritage List. Any effect the Development might have had upon its significance had it remained would be comparable to any impact to the Great Revel End Farmhouse with which it was associated.

The Grade II Wood End Farmhouse will be assessed alongside Wood End Farm Cottages, as research indicates that they form part of a single historical entity and landholding (e.g., on the 1841 Tithe mapping they are recorded within the same ownership and occupancy).

No further heritage assets are considered likely to be sensitive to potential likely significant effects arising from the Development. No other heritage assets within or beyond the 1 km study area were identified which have any meaningful historical functional, visual, spatial, thematic, or other associations with the Site which might contribute to their significance, or which might otherwise by affected by the Development.

Archaeology

There is potential for later Prehistoric and Roman features focused within vicinity of Great Revel End Farm, and within the southern fields, close to a palaeochannel. Such remains are expected to be of local to regional importance. Remains of a possible deserted medieval village or extended farmstead are located near to Great Revel End Farm. This was first identified as low earthworks of ridge and furrow, boundary ditches and house platforms through aerial photography. Anomalies potentially representing Medieval or Post Medieval enclosures or house platforms were identified north of the Great Revel End Farm by geophysical surveys.

Assessment otherwise indicates a limited potential for remains of archaeological interest within the Site boundary.

Assessment Methodology

Baseline Characterisation Approach

Baseline conditions in the study area have been and will be determined using a combination of the following data sources and surveys:

- A review of evidence held at the Historic Environment Record (HER) and Historic Landscape Characterisation also held by the HER;
- Draft Local Plan evidence base including Place Services Heritage Impact Assessment (September 2024);
- Plotting of HER assets on scale plans;
- Published and unpublished reports for the surrounding area;

- Heritage Gateway website;
- National Monuments Record;
- A review of topographic and geological information;
- A cartographic regression and review of historical records for the Site charting its previous land use history, informed by a visit to the Hertfordshire Archives;
- A review of national, regional and local planning policy for cultural heritage;
- A walkover and photographic record of the Site and surrounding area to assess their existing condition, to identify any archaeological features, and to assess the Site's visual and spatial relationship with surrounding heritage assets;
- A review of LiDAR data, output using RVT and ArcMAP to provide a range of visualisations of the Site's micro topography;
- Geophysical surveys of the Site;
- A review of the ZTV; and
- The identification and assessment of importance in relation to archaeological assets and/or issues that may pose a constraint to the Development.

Scoped In Effects

Construction

The Development has the potential to result in the following impacts during the construction stage which could lead to significant effects:

- Effects to the setting of the Aubreys Camp Scheduled Monument and built heritage designated assets due to increased noise and light levels during the construction phase and the physical presence of construction works;
- Effects on archaeology from extensive below ground disturbance across the Site. Site preparation works and formation of development plateau, construction of new roads, services, and infrastructure may result in the effective removal of all buried archaeological remains within the Site.

Completed Development

- Effects on the setting of the Aubreys Camp Scheduled Monuments and built heritage assets from the physical presence of the Development within their extended settings, and other potential setting effects (e.g. noise, light and traffic). The Development will include a green buffer and SANG area at the eastern extent of the Site, which is not expected to have any direct or indirect impacts upon the Scheduled Monument or its setting and significance, although this will be confirmed in the assessment.

Non-Significant Effects

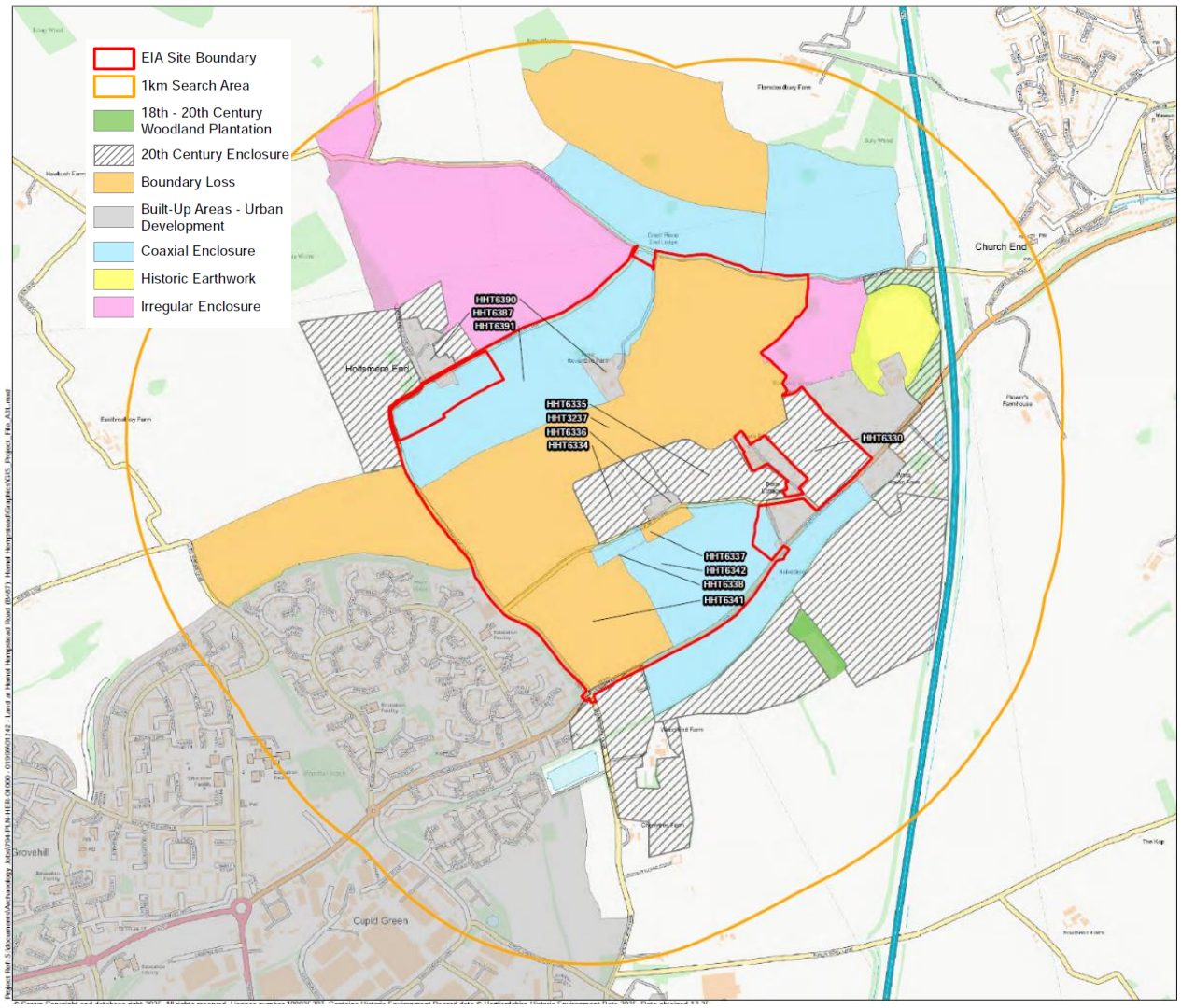
The following impacts are not considered to lead to significant effects and consequently will be scoped out of the assessment due to assets not sharing a visual, functional or historical relationship with the Site:

- Historic Landscape Character - the Site's Historic Landscape Character (HLC) is proposed to be scoped out of the ES. Historical research and the Site visit reveal that the Site forms a predominantly late 20th-century landscape characterised by large-scale field amalgamations and modern enclosure (contrary, in part, to the HLC data held by the Historic Environment Record [HER]). Some limited time-depth remains within the Site area, relating to areas of remnant field boundaries (primarily to the edges of the Site), the two historical laneways (Holtsmere End Lane and Little Revel End Lane), which, in conjunction with surviving historical

farms proximal to the Site, evidence its evolution. However, the overall significance of the Site as a historical landscape is considered to be limited and insufficient to qualify as a non-designated heritage asset in its own right. HLC is therefore not proposed to be scoped in as a potential receptor. A Historic Landscape Map is provided at Figure 13.2 to present the Site and surrounding historic landscapes;

- Relevant designated assets within 1km from the Site, where the Site and Development forms no part of their settings; and
- Designated assets more than 1km from the Site and those within 1km that are clearly screened by topography/ vegetation/ built environment and have no significant historical association.

Figure 13.2: Historic Landscape



Method

The Site has already been subject to a desk-based assessment, site walkover and geophysical surveys. The need for and scope of any further archaeological information to inform the planning application will be agreed in consultation with the HCC Archaeologist through a Written Scheme of Investigation.

Construction and Completed Development

Effects will be assessed using a staged process that will:

- Identify and assess the importance (or significance in NPPF terms) of the heritage assets;
- Identify and assess the magnitude of impact to the heritage assets; and
- Assess the significance of effects, using a matrix-based approach which considers the importance and magnitude of effect.

The assessment will be based on worst-case assumptions regarding the likely extent of ground disturbance associated with construction.

The effects on the setting of built heritage assets will be based on the Parameter Plans, and the findings of other assessments such as noise and traffic. The assessment will also be informed by the landscape and visual assessment photographic viewpoints.

Cumulative Effects

The cumulative assessment will assess likely significant construction and completion cultural heritage effects around the Development, factoring in the influence of relevant cumulative schemes which are situated immediately north and south of the Site boundary (including relevant DBC and SADC site allocations immediately north and south of the Site).

Due to the scale of the Site and Development, cumulative schemes beyond the those immediately adjacent are too far from the Site to result in any meaningful or relevant cumulative effect and will therefore be excluded from the assessment.

Assessment Criteria

The chapter will follow the following policy and guidance:

- NPPF (Chapter 16);
- Relevant local plan policies;
- Historic England guidance, particularly GPA2: Managing Significance in Decision-Taking in the Historic Environment[54] and GPA3: The Setting of Heritage Assets (2nd edition)[55]; and
- Chartered Institute of Archaeologists (CIfA) guidance, including Standard Guidance for Historic Environment Desk-Based Assessments[56].

The assessment of impacts to the setting of heritage assets will follow the 5-step process set out in GPA3.

Consultation will be held with Historic England and HCC / SADC / DBC officers through pre-application discussions.

The assessment of potentially significant effects on sensitive receptors will consider the receptor sensitivity (on a scale of high, medium, low and negligible) and the magnitude of change (on a scale of high, medium, low and negligible) to determine significance (on a scale of major, moderate, minor and negligible). The assessment will aim to quantify impact where possible. Where quantification is not possible, qualitative assessments will be used and justified. Effects that are judged to be major or moderate are considered to be significant.

Approach to Mitigation

[54] Historic England, 2015. Managing Significance in Decision-Taking in the Historic Environment. Historic Environment Good Practice Advice in Planning: 2. July 2015

[55] Historic England, 2017. The Setting of Heritage Assets. Historic Environment Good Practice Advice in Planning Note 3 (Second Edition). December 2017.

[56] Chartered Institute of Archaeologists, 2017. Standard Guidance for Historic Environment Desk-Based Assessment. January 2017.

Construction

No heritage assets are proposed to be demolished as part of the Development and where possible, important archaeology and historic landscape features would be retained.

Completed Development

Cultural heritage impacts, such as effects on the setting of heritage assets, will be minimised through good design. The SANG land will be implemented on eastern portion of the Site, setting the built development back from the Aubreys Camp Scheduled Monument and providing green infrastructure buffers. The Grade II Listed Building Great Revel End Farm and two historical laneways (Holtsmere End Lane and Little Revel End Lane) (non-designated heritage assets) would be retained within the Development and opportunities will be explored for enhancement.

Assumptions and Limitations

The conclusions drawn in this assessment are based on the baseline conditions (presented above), which are derived in part from the data held and supplied by the Hertfordshire HER (January 2025). In establishing the baseline conditions, for the purposes of this assessment, both the accuracy and currency of the data supplied has necessarily been assumed.

14 Landscape and Visual

Key Baseline Considerations
Existing Baseline The Site and immediate area are not designated for any landscape quality designation. The edge of the designated Chilterns National Landscape lies approximately 1km to the north of the Site. There is no significant intervisibility between the Site and the National Landscape on account of intervening screening features of landform and vegetation. The Site lies alongside the north eastern built edge of Hemel Hempstead beside Holtsmere End Lane, the hamlet of Holtsmere End and the B487 Hemel Hempstead Road. The Site comprises a series of open undulating agricultural fields, which are defined, in part, by hedgerows and mature tree belts. The Site extends around properties at Little Revel End and includes properties at Great Revel End Farm. Landscape Character Assessment has been undertaken by Natural England, Hertfordshire County Council and St Albans Council. Within the Hertfordshire Landscape Character Assessment (2004) the site is located within the Revel End Plateau Character Area and the Upper Ver Valley Character Area, The North Hemel Hempstead Landscape Assessment (2024) locates the Site within the three 'assessment parcels': E- Gaddesden Lane Southern Slopes; F- Revel End Plateau, and G- Upper Ver Valley. Built development will be located within F- Revel End Plateau and G-Upper Ver Valley. When considering landscape sensitivity these two parcels are concluded to be of "medium sensitivity" by the report. Public footpaths cross the Site, as does a single lane track to Little Revel End. The Nickey Line, a long distance recreational footpath and cycleway lies to the south of the Hemel Hempstead Road close to the Site, which connects with the Hertfordshire Way Long Distance Route. Electricity pylons and powerlines lie within the Site. *Future Baseline* In the absence of the Development, the Site would continue to be farmed as agricultural land and would be subject to the influences of built development of the wider development Hemel Garden Communities (HGC) - North Hemel and East Hemel, assuming these come forward in line with their relevant site allocations.
Study Area
The study area has been defined through winter and summer field work and desk-based assessment. The study area is where it is judged that within this landscape there could be degrees of impact (i.e., change in landscape or intervisibility with the Development) and therefore potential effects on landscape and visual receptors as a result of the Development. From initial baseline studies it is expected that the Study Area will cover a 1.5km area but will primarily focus within a 1km area. The final study area will be informed by a Zone of Theoretical Visibility (ZTV) which is based on the maximum building heights and extent parameters.
Receptors
The receptors which have the potential to experience likely significant effects, are as follows: ▪ Landscape – The Site (to include physical features within it) and its immediate area (including Landscape Character Areas); and

- Visual – Nearby residential properties to include those at Little Revel End, Great Revel End Farm (within the Site) and users of PRoWs within and close to the Site.

Assessment Methodology

Baseline Characterisation Approach

A landscape and visual appraisal of the Site has already been undertaken, informed by a desk-based study and Site visits. These will be updated as appropriate and informed by a review of the following sources:

- NPPF;
- Adopted SADC Local Plan;
- Emerging SADC Local Plan;
- St Albans Local Plan 2041, Broad Locations Landscape and Visual Appraisal (September 2024)[57];
- Herts Landscape Character Area Statements-St Albans District[58];
- North Hemel Hempstead Landscape Assessment (2024)[59];
- National Character Area Profiles (Natural England)[60]; and
- Green Infrastructure Strategy, Hemel Garden Communities[61].

A Landscape and Visual Impact Assessment (LVIA) will be prepared and presented as an ES chapter. The detailed baseline appraisal for assessment purposes will be informed through a review of landscape characterisation work, together with field surveys of the Site and the surrounding landscape. This will include an understanding of the area of the landscape that may be affected and the area in which the Development may be visible.

The LVIA will include a review of relevant landscape planning policies and existing landscape character assessments as well as baseline fieldwork prior to undertaking an assessment of the effects on landscape character and visual amenity.

Landscape Character

The baseline landscape will be described by reference to existing landscape character assessments and by a description and review of the Site and its immediate context. This will provide an understanding of the area that may be affected, such as landscape receptors within and near to the Site that may result in direct or indirect effects. The assessment will include reviewing the National Character Area Profiles (Natural England)[62], Hertfordshire Landscape Character Assessment and the North Hemel Hempstead Landscape Character Assessment (September 2024)[63].

Landscape receptors (i.e., landscape resources that have the potential to be affected) will be assessed in terms of their sensitivity. This combines judgements on the susceptibility of the receptor to the type of change or development that is specifically proposed, and the value attached to the landscape receptor.

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[57] SADC, 2024. St Albans Local Plan 2041. Borad Locations – Landscape and Visual Appraisal. September 2024.
[58] SADC (multiple years). Hertfordshire Landscape Character Area Statements. St Albans District.
[59] Hawkinson Duckett Associates, 2024. North Hemel Hempstead Landscape Assessment (Rev E). September 2024.
[60] Natural England, 2025. National Character Area Profiles. https://nationalcharacterareas.co.uk/
[61] Hemel Garden Communities, 2024. Green Infrastructure Strategy. July 2024.
[62] https://nationalcharacterareas.co.uk/

[63] Hankinson Duckett Associates, 2024. North Hemel Hempstead Landscape Assessment (Rev E). September 2024.

Visual Amenity

The baseline visual study has been undertaken to provide an understanding of the area in which the Development may be visible. It considers the groups of people who may experience views, the viewpoints where they may be affected, and the nature of these views. Visual receptors include residents; users of public rights of way, open spaces, and recreational facilities; highways users; and people at their place of work.

A series of suggested viewpoints/receptors to be used within the LVIA were identified based on desk-based research and site surveys. This includes viewpoints for residents, users of PRoWs and highway users. The viewpoint plan was issued to SADC for review and agreement in December 2024 (see Appendix 14.1). The SADC Landscape's Officer concluded that *"the Potential Receptors / Locations that are to be considered during the winter field work is a supported approach and these are welcomed to ensure that all areas where views of the site might be attained are assessed. The viewpoints themselves are supported and would cover a sufficient area. A preference of mine would be to include a viewpoint on the western boundary opposite viewpoint 8 at the entrance of the single track road from Holtsmere End Lane"* (email response dated 14 January 2025*).* The location of the final viewpoints, including the additional requested viewpoint by the SADC Landscape Officer is presented in Appendix 14.1. This has taken into account a winter site visit.

Baseline Photographs (i.e., Type 1 Annotated Viewpoint Photographs as referred to in TGN 06/19) February 2024 will used within the LVIA. As these are taken during the winter months, the photographs demonstrate winter views when vegetation is not in full leaf, thus effectively representing a 'worst case' scenario where there is likely to be greater visibility across the landscape than would be the case during the summer months when planting provides screening and containment. Given that summer fieldwork has also been undertaken, the LVIA will be able to comment on seasonal variations.

The viewpoints and receptors are considered to provide a proportionate level of assessment for the LVIA process to enable judgments to be made on the magnitude of change and level of visual effect.

Scoped In Effects

Construction and Completed Development:

The Development has the potential to result in the following impacts and effects during construction and from the completed Development which could lead to likely significant effects in respect of the following:

- Effects on the landscape character of the Site and its immediate context including. This will include consideration of:
  - Effects on topography and local character receptors; and
  - The landscape setting of farmsteads at Great and Little Revel End, and Holtsmere End and character of Little Revel End Lane.
- Effects on localised landscape receptors within or bordering the Site, including woodland belts, hedgerows, and mature trees; and
- Effects of Development on the visual amenity of:
  - Users of PRoWs within the Site and surroundings
  - Users of Little Revel End Lane – and the Nickey Line to the south;
  - Residents and visitors within the Site and its immediate setting
  - Users travelling along Hemel Hempstead Road;
  - Visual receptors to elevated vantage points east of M1; and
  - Users travelling along Hemel Hempstead Road near the Site.

Cumulative Effects

Construction and the completed Development has the potential for significant cumulative effects, including other broad locations - Future local communities to the west, and south (H2 – East Hemel Hempstead (North), H3 – East Hemel Hempstead (Central) H4 – East Hemel Hempstead (South)).
Method
A Landscape and Visual Impact Assessment (LVIA) will be produced in line with Guidelines for Landscape and Visual Impact Assessment (GLVIA3;), and this will be presented as an ES Chapter. The purpose of the LVIA will be to review landscape character and visual amenity, and to assess the landscape and visual effects of the Development (i.e., that is presented by this application) on the receiving landscape receptors and visual receptors. The LVIA will evaluate the level of effects during the construction phase, on completion of the Development (i.e., at year 1) and in the longer term (i.e., 15 years after completion of the Development, when the landscape proposals implemented by the Development have established and are maturing). The judgements that will be made in respect of landscape and visual effects will be a combination of the sensitivity of the receptors and the magnitude of the effect, alongside professional qualitative judgment which is a very important part of the LVIA process as expressed by GLVIA3. The LVIA will be informed by photomontages prepared using the Landscape Institute Technical Guidance Note on the Visual Representation of Development Proposals[64] as described above (Type 1).
Assessment Criteria
The assessment methodology that will be used has been developed through the Guidelines for Landscape and Visual Impact Assessment, GLVIA3 (2013); and Notes and Clarifications on aspects of the 3rd Edition Guidelines on Landscape and Visual Impact Assessment (GLVIA3) LITGN-2024-01[65]. In addition, the chapter will follow the Landscape Institute's Guidance TGN 06/19, and TGN 02/21[66]. GLVIA3 observes that it is not essential to establish a series of thresholds for the different levels of effects, although the distinction between levels can be helpfully defined by using a word scale such as major, moderate, minor and negligible. The following descriptive thresholds will be used by the LVIA: Major; Moderate; Minor; and Negligible. Where it is determined that the assessment falls between or encompasses two of the defined thresholds then the judgement will be described as, for example, Moderate-Minor. This indicates that the effect is assessed to lie between the respective definitions or to encompass aspects of both. Effects considered to be 'significant' will be effects that are Major or Major- Moderate.
Approach to Mitigation
Construction To protect landscape features to be retained within the Site and minimise adverse visual amenity effects associated with construction, works would be carried out in accordance with standard practice procedures to minimise impacts. These measures will include the protection of vegetation, use of hoarding, careful siting of construction compounds etc, and will be included in the Outline CEMP. *Completed Development*

[64] Landscape Institute, 2019. Visual Representation of Development Proposals. September 2019.
[65] Landscape Institute, 2024. Notes and Clarifications on aspects of the 3rd Edition Guidelines on Landscape and Visual Impact Assessment.
[66] Landscape Institute, 2021. Assessing Landscape Value Outside of National Designations. May 2021.

‘Primary’ or embedded mitigation will form part of the parameter plans and will be informed by the LVIA. The Development will seek to respond to the local landscape context and character and will seek to retain and protect important landscape features such as mature trees and hedgerows. The maximum extent of built development and building heights will be carefully defined through the baseline work of the LVIA. The Development will deliver a multifunctional framework of landscape habitats that will provide benefits for local landscape character, biodiversity, recreation and adaption to climate change. This includes new structural planting of native woodland, hedges and trees to integrate the built development into the landscape. The green infrastructure will aim to create a connected, multifunctional habitat mosaic which embraces the Site's landscape and ecological assets. The mosaic will provide areas of ecological value including hedgerows, grassland, wetland and woodland habitats for wildlife and enjoyment by new and existing communities. It will also seek to improve pedestrian, bridleway and cycle provision, creating new multifunctional corridors with opportunities for users to enjoy the countryside through increased access. An Outline LEMP will accompany the planning application which will set out the principles with regard to management of the green infrastructure.
Assumptions and Limitations
The assessment process will consider the likely significant effects of the Development using the current knowledge of the Site and its context; Site surveys and investigation; and desktop analysis which will include publicly accessible information. Appropriate regard will made to national and local planning policy, and relevant legislation, guidance and best practice current at the time of preparing the LVIA. The baseline fieldwork analysis has been undertaken in October 2024 and February 2025, such that there will good understanding of seasonal visibility across the landscape. Photographs will be taken from publicly accessible locations to provide representative views for visual receptors. It will not be possible to take photographs from properties as these are private views. However, reasoned assumptions will be made on visibility through the fieldwork and, where possible, through the use of photographs from nearby public locations to provide an understanding of visibility.

15 Climate Change

15.1 Climate change in the context of EIA can be considered broadly in two parts:

- The impact of greenhouse gas emissions (GHGs) caused directly or indirectly by the Development, which contribute to climate change; and
- The potential impact of changes in climate on the Development, which could affect it directly (climate risks) or could modify its other environmental impacts (inter-related effects).

15.2 Inter-related effects with other impact pathways due to climate change in the future baseline will be assessed where applicable in each other environmental topic chapter.

Key Baseline Considerations
Existing Baseline Land within the Site comprises mainly arable farmland with occasional hedgerows and trees at the field divisions. While agricultural activity does cause direct and indirect greenhouse emissions or in some cases sequestration (for example from livestock manure, fuel and fertiliser use, and changes in soil carbon stocks from grass or crop growth), these are of a low intensity per hectare relative to industrial or other developed land uses. The Site is not a significant carbon store, as the land does not include peat deposits or extensive woodland, so soil and vegetation carbon stocks that may be subject to disturbance are relatively minor. The existing baseline for GHG emissions will therefore be treated as zero for the EIA, as a conservative position for Development impacts. The current climatic baseline is the regional climate and weather patterns, recorded in Met Office data, but in the context of trends in global climate changes affecting the UK climate, which are sufficiently well understood to be considered part of the known baseline. *Future Baseline* In the absence of the Development, the future physical site baseline for GHG emissions is assumed to be the continuation of agricultural use, likely with a decrease in the carbon intensity of this activity over time as land management and fuel and machinery use are decarbonised in line with the UK's targets. The future physical site baseline for GHG emissions will therefore be treated as zero for the EIA, as a conservative position for Development impacts. The future climatic baseline will, as noted above, change due to the influence of global climate change on the UK's climate and weather patterns. The latest projections for this, published by the Met Office, will be used in the assessment, discussed further below. The influence of climate change on the future baseline will also be assessed where relevant in the future baseline section of each environmental topic chapter, using information provided from the probabilistic climate change projections.
Study Area
The impact of GHG emissions occurring due to the Development on the global atmospheric concentration of the relevant GHGs, expressed in tCO_2e, will be considered in the assessment. GHG emissions have a global effect rather than directly affecting any specific local receptor. As GHG

impacts are global and cumulative with all other sources, no specific geographical study area is defined for the identification of receptors or assessment of effects.
However, GHG emissions caused by an activity are often categorised into 'scope 1', 'scope 2' or 'scope 3' emissions, following the guidance of the World Resources Institute and the World Business Council Sustainable Development Greenhouse Gas Protocol suite of guidance documents.

- Scope 1 emissions: released directly by the entity being assessed, e.g. from combustion of fuel;
- Scope 2 emissions: caused indirectly by consumption of imported energy, e.g. from generating electricity supplied through the national grid; and
- Scope 3 emissions: caused indirectly in the wider supply chain, e.g. the embodied carbon in materials, transportation, or the disposal of waste products.

The assessment will seek to include emissions from all three scopes, where this is material and reasonably possible from the information and emissions factors available.
The majority of GHG emissions are likely to occur within the territorial boundary of the UK and hence within the scope of the UK's national carbon budgets. However, in recognition of the climate change effect of GHG emissions (wherever occurring) and the need, as identified in national policy, to avoid carbon leakage overseas when reducing UK emissions, potential scope 3 GHG emissions that may physically occur outside the UK will be considered where relevant. This is in line with the 2024 Supreme Court judgement in the 'Finch' case [UKSC/2022/0064] on the requirement to assess direct and indirect effects caused by a development where this causality is inevitable and the assessment can be made without straying into "*speculation and conjecture*".
The majority of GHG emissions are likely to occur within the territorial boundary of the UK and hence within the scope of the UK's national carbon budgets. However, in recognition of the climate change effect of GHG emissions (wherever occurring) and the need, as identified in national policy, to avoid carbon leakage overseas when reducing UK emissions, potential scope 3 GHG emissions that may physically occur outside the UK will be considered where relevant. This is again in line with the judgment in Finch that GHG assessment should not stop at national boundaries or not take into account developments (such as carbon transport facilities) that may have already been consented.
The climate change risk study area will be the climate projections 25 km grid cell in which the Site is located.

Receptors

GHG Emissions
GHG emissions have a global effect rather than directly affecting any specific local receptor to which a level of sensitivity can be assigned. The global atmospheric mass of the relevant GHGs and consequent warming potential, expressed in tCO_2e, will therefore be treated as a single receptor of high sensitivity. High sensitivity will be applied given the importance of the global climate as a receptor, the limited and decreasing capacity to absorb further GHG emissions without severe climate change resulting, and the cumulative contribution of GHG emission sources.
Climate Risks
As discussed below, for climate risks receptor sensitivity will not be directly defined, but rather a range of risk consequences (from 'minor' to 'severe') will be used, the definitions of which will be formulated with regard to the sensitivity of buildings and residents to hazards.

Assessment Methodology

Baseline Characterisation Approach

Baseline data collection will be from published documents, statistics and design information. No baseline survey is required.

Scoped In Effects

GHG Emissions - Construction

- 'Embodied carbon' in construction materials used, i.e. the indirect GHG emissions from the supply chain for those materials;
- Direct GHG emissions from construction activities (e.g. fuel consumption by construction plant) are likely to be a smaller impact, but will be included where information is available and where this is material to the assessment.

GHG Emissions - Completed Development

- Direct and indirect GHG emissions from operational energy demand from the occupiers of the Development; and
- Direct and indirect GHG emissions from transport trips generated by the completed, occupied Development.

Climate Change Risks - Construction

- Climate risks, particularly to the later construction phases will be included in the assessment.

Climate Risks - Completed Development

- The main risks to the Development from climate change over its operating life are expected to be flooding, which will be assessed with climate change allowances in the Water Resources and Flood Risk Chapter (and accompanying FRA, and potential overheating and water scarcity during increased summer heatwave/drought events.

Cumulative Effects

- All developments that emit GHGs have the potential to impact the atmospheric mass of GHGs as a receptor and so may have a cumulative impact on climate change. Consequently, cumulative effects due to other specific local development projects will not be predicted individually but are taken into account when considering the impact of the Development by defining the atmospheric mass of GHGs as a high sensitivity receptor.
- Similarly, the cumulative effect of all other developments globally on predicted future climatic conditions, and hence the risk assessment and resilience/adaptation measures, will be taken into account through use of the RCP8.5 scenario in the probabilistic climate change projections (discussed below) so a separate cumulative assessment is not required.

Inter-related Effects

- The main applicable environmental pathways for potential inter-related effects (also known as in-combination effects) are expected to be hydrology, ecology, landscape planting, human health and noise (with respect to ventilation). These will be assessed through a climate risk assessment and inter-related effects assessment using site-specific climate projections from the UKCP18 dataset.
- Consideration of inter-related effects (such a changing future baseline and sensitivity of receptors) will be also given in each respective topic chapter of the ES, where applicable, using the climate projections data.

Non-Significant Effects

The IEMA guide 'Assessing Greenhouse Gas Emissions and Evaluating their Significance'[67] indicates that emissions sources individually less than 1% and collectively less than 5% of the lifecycle emissions of the Development can be scoped out of the assessment. Such sources are considered to be *de minimis* and non-material to the assessment conclusions, therefore being disproportionate to assess in detail.

Construction

- GHG emissions from construction plant and management of construction waste are likely to be *de minimis*.

Completed Development

- Maintenance and Refurbishment - Given the expected UK trajectory of decarbonisation to 2050, future maintenance and refurbishment is likely to have substantially lower carbon intensity than the initial construction stage and so is not proposed to be assessed separately.
- Supply of potable water and treatment of wastewater – these are considered to be *de-minimis* sources, unlikely to be a material source of emissions relative to embodied carbon, energy and transport, and are not proposed to be assessed further.
- Household waste and its management by the waste authority – this is likely to be de minimise and cannot be assessed meaningfully as such is not proposed to be assessed.
- Soil carbon sequestration - The baseline agricultural land use is not a significant carbon stock, as discussed above. Where possible, existing hedgerows and trees would to be retained and incorporated in landscaping for the Development, and further landscape planting is proposed. On this basis, no significant loss of carbon stocks (in soils or vegetation) is expected and assessment of land use change is proposed to be scoped out.

Cumulative

All developments that emit GHGs have the potential to impact the atmospheric mass of GHGs as a receptor and so may have a cumulative impact on climate change. Consequently, cumulative effects due to other specific local development projects will not be predicted individually but are taken into account when considering the impact of the Development by defining the atmospheric mass of GHGs as a high sensitivity receptor.

Similarly, the cumulative effect of all other developments globally on predicted future climatic conditions, and hence the risk assessment and resilience/adaptation measures, will be taken into account through use of the RCP8.5 scenario in the probabilistic climate change projections (discussed below) so a separate cumulative assessment is not required.

Method

Overview and Guidance

The assessment will be undertaken in line with the following industry guidance:

- IEMA 'Assessing Greenhouse Gas Emissions and Evaluating their Significance'[68]; and
- IEMA 'Climate Change Resilience and Adaptation'[69].

[67] IEMA (2022): Environmental Impact Assessment Guide to: Assessing Greenhouse Gas Emissions and Evaluating their Significance. *2nd Edition*. [Online] Available at: https://www.iema.net/resources/blog/2022/02/28/launch-of-the-updated-eia-guidance-on-assessing-ghg-emissions, accessed 02/09/24.

[68] IEMA (2022): Environmental Impact Assessment Guide to: Assessing Greenhouse Gas Emissions and Evaluating their Significance. *2nd Edition*. [Online] Available at: https://www.iema.net/resources/blog/2022/02/28/launch-of-the-updated-eia-guidance-on-assessing-ghg-emissions, accessed 02/09/24.

[69] IEMA (2020): Environmental Impact Assessment Guide to: Climate Change Resilience & Adaptation. [Online] Available at: https://www.iema.net/resources/reading-room/2020/06/26/iema-eia-guide-to-climate-change-resilience-and-adaptation-2020, accessed 02/09/24.

Additional guidance used for the quantification of GHG emissions and climate risk assessment includes:

- Greenhouse Gas Protocol suite of documents from the World Resources Institute and the World Business Council for Sustainable Development (WRI and WBCSD)[70];
- Valuation of Energy Use and Greenhouse Gas: supplementary guidance to the HM Treasury Green Book from the Department for Energy Security and Net Zero (DEZNZ, 2024 or as updated)[71];
- UK Government GHG Conversion Factors for Company Reporting (DEZNZ and BEIS, 2024 or as updated)[72]; and
- The UK Green Building Council (UKGBC) Framework for Measuring and Reporting of Climate-related Physical Risks to Built Assets[73].

GHG Emissions

Direct and indirect GHG emissions will be calculated for construction and occupation of the Development by applying published emissions factors which relate a given level of activity, a physical or chemical process, or amount of fuel, energy or materials used to the mass of GHGs released as a consequence.

Emissions will be assessed for the total construction phase and for representative years of occupation of the Development. This will take into account changes in the future baseline such as grid electricity generation decarbonisation, where feasible and applicable. Emissions factors and projections published by DESNZ and BEIS or other literature sources will be used as required.

Construction-stage impacts will be estimated based on available benchmark values for buildings typical of the Development, published life cycle assessment studies, or environmental product declarations for key materials and components, applicable to lifecycle stages A1-A5 (materials and products manufacturing, transport to site, and installation).

Operational-stage impacts will be estimated based on published benchmark figures for energy consumption or on development-specific performance information if available. Impacts will be assessed taking into consideration any proposed low/zero carbon energy supply, the projected changing carbon intensity of the UK electricity grid, and potential for decarbonisation of transport.

The GHGs considered in this assessment will be those in the 'Kyoto basket'[74] of global warming gases expressed as their CO_2-equivalent (CO_2e) global warming potential (GWP). GWPs used will typically be the 100-year factors in the Intergovernmental Panel on Climate Change Sixth Assessment Report[75]

[70] WRI and WBCSD (2004): The Greenhouse Gas Protocol: A Corporate Accounting and Reporting Standard. Revised edition, Washington and Geneva: WRI and WBCSD.

[71] DESNZ (2023): Valuation of Energy Use and Greenhouse Gas: Supplementary guidance to the HM Treasury Green Book. [Online] Available at: https://www.gov.uk/government/publications/valuation-of-energy-use-and-greenhouse-gas-emissions-for-appraisal, accessed 02/09/24.

[72] DESNZ and BEIS (2024): Government Conversion Factors for Company Reporting of Greenhouse Gas Emissions. [Online] Available at: https://www.gov.uk/government/collections/government-conversion-factors-for-company-reporting, accessed: 02/09/24.

[73] UKGBC (2022): A Framework for Measuring and Reporting of Climate-related Physical Risks to Built Assets. [Online] Available at: https://ukgbc.org/wp-content/uploads/2022/02/UKGBC-Measuring-and-Reporting-Physical-risk-Report.pdf, accessed 02/09/24.

[74] The 'Kyoto Basket' encompasses the following greenhouse gases: carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbons, perfluorocarbons, sulphur hexafluoride (SF_6) and nitrogen trifluoride (NF_3).

[75] Table 7.15 in IPCC (2021): Climate Change 2021: The Physical Science Basis. Contribution of Working Group I to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change [Masson-Delmotte, V., P. Zhai, A. Pirani, S.L. Connors, C. Peña, S. Berger, N. Caud, Y. Chen, L. Goldfarb, M.I. Gomis, M. Huang, K. Leitzell, E. Lonnoy, J.B.R. Matthews, T.K. Maycock, T. Waterfield, O. Yelekçi, R. Yu, and B. Zhou (eds.)].

or as otherwise defined in emissions factors and for national reporting under the United Nations Framework Convention on Climate Change.
As GHG emissions can be quantified directly and expressed based on their GWP, the magnitude of impact will be reported numerically as tCO_2e rather than requiring a descriptive scale.
Temporal Scope
GHG emissions from construction and occupation of the Development will be assessed. The varying atmospheric residence time of GHGs once emitted, and their differing climate impact, will be considered through the use of 100-year global warming potential (GWP) factors to express these in a common CO_2e metric, discussed below.
Climate Risks
Climate risks to the Development will be assessed in a risk matrix format, considering acute and chronic physical hazards and the direct and indirect potential consequences for the Development, its occupiers and other users.
The risk assessment will use climate change data for the Site in the Met Office Hadley Centre 'UKCP18' probabilistic projections[76]. Projections for the global representative concentration pathway (RCP) 8.5 will be used as a worst-case approach, as this is a high-emissions scenario assuming 'business as usual' growth globally with little additional mitigation to combat climate change. Mid-century and end-of-century datasets will be used.
For construction, climatic changes over the near term not considered likely to introduce climate extremes at a higher risk level than contractors are adapted to, within the baseline variability of weather in the UK, the construction programme is proposed to be phased over around 12 years from 2029 to 2041. Therefore the focus of the assessment would be the later stages of construction.
For the completed Development, the climate risk assessment will consider potential climatic conditions in the period out to 2100, given the long or indefinite operational life of a housing development.
The assessment will present recommendations for further whole-life GHG mitigation, which will follow the principles of the GHG management hierarchy (avoid, reduce, off-set), in order to reduce, as far as reasonably practicable, the anticipated GHG emissions over the Development's lifecycle.
The assessment will also present recommendations for adaptation or improving resilience to climate risks, which are likely to include design measures to manage ventilation, orientation of glazing and hence overheating risk; measures to encourage lower water consumption; sustainable urban drainage design with flood attenuation; and design of landscaping for shading and climate change resilience.

Assessment Criteria

GHG Emissions
The IEMA assessment guidance for GHG emissions describes five levels of significance for emissions resulting from a development, each based on whether the GHG emission impact of the development will support or undermine a science-based 1.5°C compatible trajectory towards net zero. To aid in considering whether effects are significant, the guidance recommends that GHG emissions should be contextualised against pre-determined carbon budgets, or applicable existing and emerging policy and performance standards where a budget is not available or not meaningfully applicable at the scale of development assessed. It is a matter of professional judgement to integrate these sources of evidence and evaluate them to determine significance.

[76] MOHC (2021): UK Climate Projections User Interface, https://ukclimateprojections-ui.metoffice.gov.uk/ui/home accessed 02/09/24.

Taking the guidance into account, the following will be considered in contextualising the Development's GHG emissions:

- the magnitude of net GHG emissions in construction and operation as a percentage of national and local carbon budgets;
- the GHG emissions intensity of the Development at lifecycle stages A1-A5 (materials and products manufacturing, transport to site, and installation) relative to business-as-usual and good-practice performance benchmarks;
- the GHG emissions intensity of the Development's operational energy use relative to business-as-usual and good-practice performance benchmarks; and
- whether the Development contributes to, and is in line with, the applicable UK policy for GHG emissions reductions, where this policy is consistent with science-based commitments to limit global climate change to an internationally-agreed level (as determined by the UK's current Nationally Determined Contribution under the Paris Agreement).

Effects from GHG emissions will be described as adverse, negligible or beneficial based on the following definitions, which closely follow the examples in Box 3 of the IEMA guidance.

- Major Adverse: the Development's GHG impacts would not be compatible with the UK's net zero trajectory. Its GHG impacts would not be mitigated, or may be compliant only with do-minimum standards set through regulation. The Development would not provide further emissions reductions required by existing local and national policy for projects of this type. A project with major adverse effects is locking in emissions and does not make a meaningful contribution to the UK's trajectory towards net zero.
- Moderate Adverse: the Development's GHG impacts would not be fully compatible with the UK's net zero trajectory. Its GHG impacts would be partially mitigated and may partially meet the applicable existing and emerging policy requirements, but it would not fully contribute to decarbonisation in line with local and national policy goals for projects of this type. A project with moderate adverse effects falls short of fully contributing to the UK's trajectory towards net zero.
- Minor Adverse: the Development's GHG impacts would be compatible with the UK's 1.5°C-aligned trajectory and would be fully consistent with up-to-date policy and good practice emissions reduction measures. The Development may have residual emissions, but these are substantially reduced. A project with minor adverse effects is fully in line with measures necessary to achieve the UK's trajectory towards net zero.
- Negligible: the Development would achieve emissions mitigation that goes well beyond existing and emerging policy compatible with the 1.5°C-aligned trajectory, such that radical decarbonisation or net zero is achieved well before 2050. A project with negligible effects provides GHG performance that is well 'ahead of the curve' for the trajectory towards net zero and has minimal residual emissions.
- Beneficial: the Development would result in emissions reductions from the atmosphere, whether directly or indirectly, compared to the without-project baseline. As such, the net GHG emissions would be below zero. A project with beneficial effects substantially exceeds net zero requirements with a positive climate impact.

Major and moderate adverse effects and beneficial effects will be defined as significant.
Minor adverse and negligible effects will be defined as not significant.

Climate Risks

In accordance with IEMA's 2020 guidance for climate change risk and resilience or adaptation measures, a risk assessment will be undertaken. This will use a risk assessment matrix approach to evaluate the potential impact of climatic hazards, consequence, likelihood and resulting risk profile to

the Development and its users. The level of influence the project design can have on the risk will be considered in respect of mitigation.
Descriptive scales will be used to characterise the probability and consequence of each hazard, each then assigned a rating from which a resulting risk score will be determined multiplicatively.
Receptor sensitivity will not be directly defined, but rather a range of risk consequences from 'minor' to 'severe' will be used, the definitions of which will be formulated with regard to the sensitivity of buildings, occupiers, visitors and workers to the hazard. The resulting scale of risk ratings will range from 'very low' to 'very high'. Risk ratings greater than 'moderate' will be considered to be significant.
The assessment will also consider how impacts of the Development, in combination with the effects of climate change, may affect receptors throughout the construction phase and operational lifetime. The assessment will be qualitative only and will not aim to be determinative of significance levels, which will have been assessed in the applicable ES topic chapters; but it will identify where there is the potential for inter-related effects to increase or decrease the significance of effects reported alone.

Approach to Mitigation

Construction
The Outline CEMP will include standard practice measures drawn from HSE guidance[77] for the protection of workforce safety, health and wellbeing under variable temperature conditions. The Outline CEMP will also include measures to protect soil resources, minimise waste and other resources. A CTMP will include measures to manage construction traffic efficiently.
Completed Development
An Energy Strategy will accompany the application, which will set out measures to reduce energy demand and to supply the demand through low- or zero-carbon sources. The layout and mix of uses would be designed to minimise the need to travel and encourage active and sustainable transport including a mobility hub and active travel routes and connections.

Assumptions and Limitations

There are two main expected limitations to the assessment. Firstly, the Development is subject to an outline planning application with all matters save access reserved, and hence is at an early parameters-based stage of design. The assessment will therefore use broad and conservative assumptions for a 'business-as-usual' case to estimate the magnitude of GHG emission impacts prior to further mitigation that could be specified at the detailed design stage, in order to be conservative.
Secondly, both the GHG impacts and the climatic risks to the Development over its life could change depending on the global warming trajectory that eventuates. They will also be affected by adaptation or mitigation at a national level, e.g. the decarbonisation of energy supplies and transport. The assessment will use climate projections based on present-day knowledge. The climate projections to be used provide a probabilistic range of data which allows for known uncertainties.
With regard to GHG emissions, present-day emission factors in Defra/BEIS and DESNZ guidance will be used, which represent a conservative position given the expected decarbonisation over time, but future projections will also be considered where available to provide context for how impacts may change over time.

[77] HSE, undated: Outdoor Working. https://www.hse.gov.uk/temperature/employer/outdoor-working.htm

16 Non-Significant Topics

Introduction

16.1 As stated within the EIA Regulations, an ES is required to identify only the 'likely significant environmental effects' of a development. The rationale for this scoping exercise has been guided by the current PPG, which highlights the expectation that the ES should focus on the 'main' or 'significant' environmental effects only. The PPG states:

"Whilst every Environmental Statement should provide a full factual description of the development, the emphasis should be on the "main" or "significant" environmental effects to which a development is likely to give rise. The Environmental Statement should be proportionate and not be any longer than is necessary to assess properly those effects. Where, for example, only one environmental factor is likely to be significantly affected, the assessment should focus on that issue only. Impacts which have little or no significance for the particular development in question will need only very brief treatment to indicate that their possible relevance has been considered."

16.2 The following topics are considered to be those where 'significant' effects are unlikely to arise from the Development. As such, these issues would not be assessed in detail through the EIA process:

- Materials and Waste;
- Ground Conditions and Contamination;
- Light Pollution;
- Microclimate – Wind, Daylight, Sunlight and Overshadowing (DSO) and Solar Glare;
- Vulnerability to Major Accidents and Disasters;
- Energy and Sustainability;
- Utilities;
- Aviation; and
- Electromagnetic Fields.

16.3 Rationale for scoping these topics out of the ES is provided in Table 16.1, with reference to the schedule of mitigation measures set out in Appendix 4.1 as appropriate.

Table 14.1: Rationale of Scoping Out Technical Topics from ES

Potential Effect	Rationale for Scoping Out
Materials and Waste	The Site is currently used for agriculture and contains one residential property at Great Revel End Farm and therefore is assumed to produce low levels of waste. There are no known areas of historic landfill within the Site. In relation to minerals, the Site is not located within the 'Sand and Gravel Belt' or a Mineral Resource Block, as identified in HCC's adopted Minerals Local Plan 2002 – 2016. There are no safeguarded waste sites within or close to the Site. *Materials* The impacts of extraction and manufacture of materials would have already been subject to environmental assessment and due to the disparate nature of the value chain cannot be assured with any accuracy. For these reasons these elements would be scoped out of the assessment. Given the outline nature of the planning application a lifecycle assessment of site arisings and Development generated resource use could not be meaningfully assessed. However the assessment of GHG emissions (Climate Change) would include mitigation measures to minimise carbon content of materials. *Waste* Waste streams arising from the construction stage of the Development would mainly comprise soil from excavation and foundation work, and is unlikely to include hazardous waste. The ES will would include an estimate of the nature, type and quantities of waste likely to be produced during the construction and operation phases in line with the EIA Regulations. A Site Waste Management Plan(s) (SWMP) will be secured through the Outline CEMP. The SWMP would set out the way in waste resources will be managed during the site preparation and construction works. Such a plan will likely include the following: ▪ Actions to meet the waste hierarchy in accordance with the principles of the Governments 'Waste Strategy'; ▪ Assigned responsibility within the Principal Contractor's organisation for the SWMP ▪ Procedures for waste handling and sorting; ▪ Targets for waste minimisation and disposal; ▪ Waste auditing and record keeping, e.g. register of waste carriers, disposal sites (including transfer stations) and relevant licensing details and testing for each waste stream; and ▪ Record keeping. A Materials Management Plan (MMP) will be produced and will be adhered to by the Contractor. This will include guidance on how to test materials to check they are suitable for reuse.

Potential Effect	Rationale for Scoping Out
	The intention would be to avoid waste generation as far as practicable and reuse as much material on-site as practicable in accordance with the waste hierarchy. Waste produced during construction would be subject to the 'Duty of Care' under the Environmental Protection Act and managed by the contractor in line with current legislation, guidance[78] and best practice, with construction waste materials disposed of by the contractor/s to appropriate recycling facilities or appropriately licensed landfills. Operational waste from the Development would comprise a mixture of residential and commercial waste arising owing to the proposed end uses. Operational waste from residential and education uses are likely to be subject to local authority waste collection and management. Additional demand should be capable of being adequately addressed through standard developer contributions. Commercial uses may involve waste disposal contracts with commercial operators. The Development will be designed to comply with SADC's recycling and waste requirements and ensure the provision of sufficient waste storage areas across the Development to enable occupants to segregate their waste and recyclables, building managers to manage capacity and appropriate access for refuse collection vehicles. It is expected that policy compliance and further details would be subject to planning conditions. Volumes of waste generated by the completed Development are therefore not expected to give rise to a significant impact on waste management infrastructure. Effects during construction and from the completed Development are not expected to give rise to a significant impact on waste management infrastructure or material resources.
Ground Conditions and Contamination	A Phase I Geo-Environmental desk-based ground conditions and contamination study of the Site has been undertaken along with a site walkover, carried out on 14th February 2025. The Applicant has also undertaken a study of natural and mining cavities and geophysical surveys at the Site which has informed this section. *Contamination* Historical mapping and record searches indicate that the potential for underlying contamination from former Site uses is relatively low. The Site is currently occupied by fields used as arable farmland and has remained largely undeveloped throughout its history, with the exception of some suspected infilled chalk pits, and other minor areas of infilling where made ground could be present. A historic landfill is located adjacent to the southern Site boundary close to the intersection of Hemel Hempstead Road and the Little Revel End. This is indicated to have operated between 1962 and 1963 and received wastes including inert waste.

[78] Including the Environment Agency's Guidance for Pollution Prevention and other relevant guidance to be followed during the handling, storage and use of such materials, including oil, chemicals, cement, cleaning materials and paint.

Potential Effect	Rationale for Scoping Out
	British Geological Survey (BGS) maps shows the Site and surrounding land to be underlain by bedrock of the Upper Chalk with superficial deposits of Clay-with-flints are indicated overlying the chalk in the northern and southern corners of the Site. No geological faults are shown on Site or in the near vicinity. The geological resources beneath the Site would be considered of medium to low sensitivity. This is principally because the Site is underlain by a mix of Lewes Nodular Chalk Formation and Seaford Chalk Formation with superficial deposits of clay-with-flints formation. The bedrock chalk which is mapped beneath the entire Site is a Principal Aquifer and while the superficial Clay-with-Flints Formation is mapped beneath the majority of the Site area. The bedrock chalk is mapped at the surface in the southern part of the Site, parts of the central area and SANG. Principal aquifers are defined by the Environment Agency as rock or drift deposits units that are important for water supply and river flow. They are highly permeable and have a large water storage capacity. Clay-with-Flints are classified as 'Unproductive Strata' (a non-aquifer). The Site defined as within Zone 3 Source Protection Zones – these are not as important as Zones 1 and 2 which would be close to any important groundwater abstractions but indicates sensitivity to ground contamination for example. There are no surface water features on Site or in the near vicinity. The nearest surface water feature is indicated to be a reservoir approximately 227m south of the Site. The Site is not located in a Nitrate Vulnerability Zone although does lie within a surface water nitrate vulnerable zone. From the desk-based studies significant contamination presence in soils would appear unlikely. Risks from hazardous ground gases appear low. Some of the Ste lies within an area where basic radon protective measures will likely be required in the construction of new buildings, and it is recommended that a detailed radon report is obtained and compared against future development proposals at the detailed design stage to mitigate the potential for adverse effects on buildings and future site users. A preliminary Conceptual Site Model for the Site has identified that future residents would probably be at most risk from contaminants within shallow soils. There appears likely to be very low risks to controlled waters or neighbouring properties. The Phase 1 geo-environmental assessment will accompany the planning application. It is expected that development of the Site will not lead to significant environmental effects, noting that standard planning conditions would be in place relate to the management and monitoring of unexpected contamination. These would be informed by further assessment that is recommended to assess soil quality across the Site, with particular focus given to areas where infilled features or made ground might be expected based on historical mapping and the geophysical surveys that have been carried out. This includes additional ground gas monitoring to complement the existing data has also been recommended in relation to the potential for accumulation of ground gases in the historic chalk pits and nearby historic landfill site. *Ground Instability*

Potential Effect	Rationale for Scoping Out
	NPPF requires an assessment for a site potentially at risk from ground instability such as natural hazards or former activities such as mining. Consideration has therefore been below to the risk of these potential causes of instability arising from existing ground conditions across the Site, as identified by the desktop data review. The chalk bedrock in and around Hemel Hempstead is known to sometimes contain cavities (voids) caused either by natural solution processes or by human activity, The risk of potential chalk dissolution has been identified to be low across the Site but will still require full consideration at the detailed design stage, or the undertaking construction of foundations and drainage, informed through additional phases of intrusive wo. Consideration will need to be given to slope stability during construction and any regrading works. The Site would be subject to intrusive investigations before detailed designs are undertaken in accordance with recommendations of BS5930 'Code of Practice for Site Investigations'. Standard measures would be in place through the Outline CEMP and planning conditions to ensure that the Development does not contribute to and is not put at unacceptable risk from, or adversely affected by, unacceptable levels of land, air or water pollution during construction and operation, in accordance with policy and regulatory requirements. A mitigation strategy would also been developed to address ground stability risks associated with chalk cavities at the detailed design stage. For example, some foundations may require measures to mitigate the risk of chalk cavities, e.g. reinforcement in traditional spread foundations, or alternative foundation types such as rafts or ground beams. If cavities are found or suspected (infilled or not) it may be necessary to treat them (e.g. by grout injection or probing) to mitigate risks of ground movement in advance of construction, with inspection by an experienced geologist or geotechnical engineer. The risk of chalk cavities will also inform the detailed drainage strategy since the use of traditional soakaways for disposal of stormwater may not be suitable except at considerably increased distances from buildings and infrastructure. It will also be important to ensure that drainage of the construction site works efficiently and the risk of possible leakages is minimised.
Light Pollution	The Site is not located within a designated Dark Sky Place or an associated buffer zone and it is not located within a National Park or National Landscape. The Chilterns NL is located approximately 830m from the Site. Being an undeveloped site, the ambient lighting environment is primarily influenced by road traffic lighting from the M1 motorway and the suburban edge of Hemel Hempstead to the west. The light levels in the northern parts of the Site are typical of a Zone E2 Rural (low district brightness) within the southern and western parts of the Site being more typical of Zone E3 Suburban (Medium brightness). Sensitive receptors to changes in lighting at the Site include highway, ecological and human receptors (residents and PRoW users).

Potential Effect	Rationale for Scoping Out
	Temporary lighting would be used during the construction stage, particularly during winter months. The use of lighting would be controlled through the standard measures included in the Outline CEMP which should avoid significant adverse effects. Disturbance effects from lighting during construction on ecological receptors would be considered in the ecological impact assessment. Artificial lighting will be required to provide a safe environment for a range of activities including construction, driving, cycling and walking, and can also be used to enhance the visual appearance of a development. Light pollution effects can include: Glare - Excessive brightness that causes visual discomfort; Sky glow - Brightening of the night sky over inhabited areas; and Light trespass - Light falling where it is not intended or needed. The completed Development will provide a modern, efficient and controlled lighting scheme which incorporates best practice design principles. New lighting proposed as part of the Development will be developed at the detailed design stage in accordance with the current British Standards, Institution of Lighting Professionals (ILP) and relevant Chartered Institution of Building Services Engineers (CIBSE) guidance. The principles of the lighting design would be presented in the Development Specification within input from project ecologist, landscape and heritage consultants to ensure that the lighting is appropriate and avoids significant adverse effects on receptors and the night sky. The effects of lighting on the setting of the Chilterns NL, landscape character, visual receptors, heritage assets and ecological receptors will be assessed in the ES. On the whole, the Development will not introduce uses which require external flood lighting. There is potential for sports to be proposed within the Development subject to ongoing discussion with the LPAs. Should these require external flood lighting, these would be sited away from sensitive receptors as far as practicable and be subject to appropriate lighting design that mitigates the potential for adverse effects on sensitive receptors. At this stage, due to controls which would be secured at the outline planning stage, it is considered that significant light pollution effects would not arise. As set out above, the qualitative effects of artificial lighting will be assessed in other ES Chapters as appropriate, including LVIA, Cultural Heritage and Biodiversity.
Microclimate - Wind, Daylight, Sunlight, Overshadowing and Solar Glare	Based upon the emerging parameters, the Development is not anticipated to be of a scale at which issues concerning wind, daylight, sunlight and overshadowing (and its effects on user comfort and amenity) are to be expected. Built development will be sufficiently set back from existing residential receptors such that any microclimate impact at existing receptors (wind comfort/safety, daylight, sunlight and overshadowing) would not be significant. Appropriate buffers would also be in place to avoid significant impacts on important ecological habitats from overshadowing.

Potential Effect	Rationale for Scoping Out
	There is no specific criterion for assessing the significance of solar glare and professional judgement has therefore been used in establishing whether the Development is likely to give rise to significant effects. Sensitive receptors are likely to include road users, including drivers along the Holtsmere End Lane, Redbourn Road, Hemel Hempstead Road and neighbouring junctions, as well as on-Site vehicle operators. Solar glare to these receptors might cause visual distraction or disability to transport controllers. At this stage, it is uncertain whether PV panels would form part of the Development and therefore it would not be possible to undertake a meaningful assessment.
Vulnerability to Major Accidents and Disasters	There are two Control of Major Accident Hazards (COMAH) sites within a 10km radius of the Site, i.e. BP and Buncefield Terminals situated approximately 1.5km south of the Site. There are no sites classified as contaminated land or regulated explosive sites across or within 250m of the Site and no history of substance storage/usage recorded across or within 250m of the Site. An oil pipeline and high voltage electricity pylons cross the Site however these are not subject to the COMAH regime. The Applicant engaged with the HSE in February 2025 who confirmed in writing that there are no HSE consultation zones crossing your Site (see correspondence in Appendix 16.2). The EIA Regulations require a description of the expected effects of the proposed development on the environment deriving from the vulnerability of the proposed development to risks of major accidents and / or disasters that are relevant to the project concerned. The IEMA Quality Mark Primer on 'Assessing Risks of Major Accidents / Disasters in EIA'[79] defines major accidents and disasters as follows: - Major accident: *'Events that threaten immediate or delayed serious environmental effects to human health, welfare and/or the environment and require the use of resources beyond those of the client or its appointed representatives to manage. Whilst malicious intent is not accidental, the outcome (e.g. train derailment) may be the same and therefore many mitigation measures will apply to both deliberate and accidental events.'* - Disaster: *'May be a natural hazard (e.g. earthquake) or a man-made/external hazard (e.g. act of terrorism) with the potential to cause an event or situation that meets the definition of a major accident.'* The IEMA Primer states that *'Major accidents and/or disasters can be scoped out of the assessment if you can clearly demonstrate that: 1. there is no source-pathway-receptor linkage of a hazard that could trigger a major accident and/ or disaster or potential for the scheme to lead to a significant environmental effect; or 2. all possible major accidents and/or*

[79] IEMA, 2020. Major Accidents and Disasters in EIA: An IEMA Primer. September 2020.

Potential Effect	Rationale for Scoping Out
	disasters are adequately covered elsewhere in the assessment or covered by existing design measures or compliance with legislation and best practice.' A screening exercise of potential major accidents and disasters has been undertaken considering the nature of the Site and the Development. This concludes that: ▪ There are very limited risks of major accidents and/or disasters: ▪ Risks which are present, such as flood risk, would be adequately covered elsewhere in the EIA; ▪ Other risks (e.g. fire, high voltage pylons, oil pipeline and chalk cavities) would be addressed by design principles secured through the outline planning application, standard planning conditions, Outline CEMP, or as a consequence of compliance with legislation (e.g. health and safety). The outcome of exercise provides justification to support scoping out of topic of Major Accidents and Disasters as a stand-alone ES chapter.
Energy and Sustainability	Energy and sustainability are material considerations relevant to the consideration of the individual planning merits of the application but are not themselves factors that require assessment under Regulation 4(2) of the EIA Regulations. Neither 'energy' nor 'sustainability' are aspects of the environment in relation to which a significant effect can be assessed in this sense (i.e. there is no source/receptor/pathway relationship for 'energy' or 'sustainability'). The energy strategy for the Development will likely comprise the use of heat pumps and renewable energy sources which is targeted to generate the majority of the Development's energy demand. The effects of the energy demand associated with the operational Development (including building and transport emissions) will be assessed by the Climate Change ES chapter. Physical aspects of the Sustainability Strategy, such as sustainable travel, renewable energy generation, sustainable urban drainage, water use reduction, habitat creation, access to nature etc. are being embedded within the Development and, as such, would be assessed by all ES topic chapters where relevant. As such, all technical assessments included within the ES will inherently test the principal sustainability design features sought as part of the planning application and the ES will not include a separate chapter on these aspects. The main sustainability features of the Development (e.g. SuDS strategy, energy strategy) will be summarised in the description of the Development included in the ES. As such, all technical assessments will inherently test the principal sustainability design features sought as part of the planning application. The outline planning application will, however, be supported by standalone Energy and Sustainability Statements for the purposes of the determination of the planning application.

Potential Effect	Rationale for Scoping Out
Utilities	Existing utility record information has been obtained by the Applicant across the Site and confirms a number of utilities and other infrastructure cross the Site, some of which form physical constraints to the Development. These include: ▪ An overhead ultra-high voltage electricity pylon route crossing the eastern part of the Site, running parallel to Holtsmere End Lane. Diversion of this primary distribution network will not be possible and its retention forms part of the Development. ▪ A pair of overhead high voltage (HV) services cross the Site from the southern end, running roughly north and turning north-west, skirting the existing residential development of Woodhall Farm. These HV cables will be diverted underground to be accommodated within the Development. ▪ Local overhead BT lines serve the local farms and dwellings. ▪ A BPA fuel pipeline crosses the Site diagonally from north-west to south-east. Diversion of this pipeline and its associated easement has been incorporated into the Development. ▪ There are no potable water, foul or surface water drainage or gas mains on or crossing the Site. However, all of these services are present in the existing residential development to the west of the Site (Woodhall Farm) and in Redbourn Road to the south of the Site. In accordance with the emerging Future Homes Standards all new homes will be fully electric. UK Power Networks, the District Network Operator, have provided a viable solution to serve the Site through connections onto the existing high voltage network. A number of new substations will be located around the Site to serve the new homes along with their associated HV and low voltage (LV) networks. Full fibre broadband to the premises will be provided to all new homes through the provision of underground infrastructure future proofing the homes and ensuring they have the infrastructure required to work from home. Virgin Media infrastructure is also present in Woodhall Farm and running along Hemel Hempstead Road which could be extended to serve the Site. Potable water in the area is supplied by Affinity Water. Wastewater is handled by Thames Water. Both have been approached with pre-development enquiries for the Site. They have identified a scheme of improvements works to serve the Site which will be undertaken by them under the standard infrastructure charge. Potable water demand and foul water will be considered in the Water Resources and Flood Risk Chapter. The Development will include appropriate easements and protective measures for infrastructure within the Site including the overhead power lines, underground oil pipeline and other services. These would be agreed in principle with statutory undertakers prior to submission of the planning application and set out in the Utility Strategy.

Potential Effect	Rationale for Scoping Out
	Significant effects on utilities are not anticipated and where relevant to topics, effects associated with potable and foul water, and physical utility connections will be assessed in the relevant topic chapters of the ES. As such, it is proposed that an ES chapter on utilities be scoped out of the ES.
Aviation	London Luton Airport is located approximately 10km north of the Site. The Site is not in a safeguarded zone for the airport or other aerodromes.
Electromagnetic Interference	New electrical plant including substations within the Site would be designed in accordance with the relevant British Standard in force at the time (e.g. BS EN 62041:2010) which sets specific limits for electro-magnetic fields. Standard easements will be maintained for the Development envelope within the vicinity of the existing overhead transmissions cables that pass through the Site to avoid potential impacts on this infrastructure. No major sources of electro-magnetic fields (such as high voltage transformers or electricity transmission line/cables) are proposed as part of the Development. The existing overhead ultra-high voltage electricity pylon cannot be diverted or undergrounded (see 'Utilities' section above). However, there is no built development proposed within the vicinity of this pylon route, and appropriate easements will be provided.

Appendix 4.1 – Mitigation Schedule

Project specific measures to avoid and / or prevent significant adverse environmental effects (i.e. mitigation measures) have been considered through the EIA scoping process, when appraising likely environmental effects.

At this stage, this has focused on 'primary mitigation' (i.e. inherent mitigation, comprising fundamental aspects of the project design) and 'tertiary mitigation' (i.e. standard environmental commitments / practices or measures required by other legislation/regulation that would occur regardless of an EIA being undertaken). These primary and tertiary measures are identified in the table below will be developed further as part of the ES. It is envisaged that mitigation will be secured through the parameter plans, design principles, suitably worded planning conditions or other mechanism, where appropriate.

ID No.	Mitigation Measure(s)	Anticipated Securing Mechanism
Primary Mitigation		
P1	**Parameter Plans** The parameter plans will include form primary mitigation measures to address a number of constraints and avoid or minimise environment effects associated with the Development. For example: ▪ Retention of important habitats and features and the use of buffers; ▪ Provision of sufficient and suitable SANG and a significant area of public open space; ▪ Appropriate set backs of built form from heritage assets and residential properties; ▪ Easements for overhead pylons; ▪ Connections and siting of uses to encourage active travel; ▪ Avoidance of built development in flood zones 2 and 3; and ▪ Maximum building heights which respond to the topography and character of the Site.	Approval of plans which will be subject to planning condition
P2	**Lighting Strategy** Principles will be developed for lighting which ensure that all external (operational) lighting is designed and installed in line with relevant British Standards (i.e. currently BS 5489-1:2020, BS EN 13201-2 – Road lighting and BS EN 12464-2 – Lighting of Work Places) and guidance (e.g. ILP's Guidance Notes for the Reduction of Obtrusive Light, Lighting Guide 1: The industrial environment and LG6: The exterior environment; ILP's PLG04; and ILP Guidance Note GN01), and or mitigation measures set out within the guidance so as to mitigate effects from obtrusive light.	Approval of preliminary Lighting Strategy (details to be subject to planning condition)

ID No.	Mitigation Measure(s)	Anticipated Securing Mechanism
	The preliminary Lighting Strategy will be prepared, in line with the above principles of design, and will be submitted to SADC for approval as part of the Application.	
P3	**Outline Surface Water Drainage Strategy** An Outline Surface Water Drainage Strategy will be developed to ensure the Development will not create an increased risk of flooding from surface water to the Site and the surrounding area. This will be prepared with reference to the HCC LLFA Summary Guidance for developers (Management of Surface Water Drainage) and industry standard guidance on the preparation of surface water strategies (Defra/Environment Agency and CIRIA). The strategy will be developed demonstrate that the requirements of any local surface water drainage planning policies have been met and the recommendations of the relevant Strategic Flood Risk Assessment (SFRA) and Surface Water Management Plan (SWMP) have been considered.	Approval of Outline Surface Water Drainage Strategy. Details of drainage to be required by planning condition.
P4	**Outline Utility Strategy** A Utilities Strategy will accompany the outline planning application. The strategy will be informed by a utilities search and consultation with statutory undertakers. The Development will require connection to foul and storm water sewers and the Strategy will seek to demonstrate that, following consultation with the service provider, the availability of drainage/sewerage infrastructure capacity has been examined and the Development would not result in undue stress on this infrastructure. The strategy will also set out the approach to diversion of utilities where required and easements which will be in place to protect utility assets.	Approval of Outline Utility Strategy. Details to be required by planning condition.
Tertiary Mitigation		
T1	**Outline Construction Environmental Management Plan (CEMP)** A Framework CEMP will be prepared by the appointed contractor in line with key legislation and guidance, as well as industry standards, codes of practice and best practice measures. Once prepared the CEMP will be submitted with the Application for approval and will control future detailed CEMP(s). The Outline CEMP will be informed the relevant legislation and the EIA process and will out the information that detailed CEMPs will be required to include, for example: ▪ Roles and responsibilities; ▪ General construction management practices;	Approval of Outline CEMP submitted with planning application. Final detailed CEMP(s) will be subject to planning condition.

ID No.	Mitigation Measure(s)	Anticipated Securing Mechanism
	▪ Construction programme and phasing; ▪ Construction hours and protocols/working methods; ▪ Good practice site housekeeping (e.g. site compounds, hoarding, security, parking, storage areas); ▪ Dust Management Plan – in line with IAQM Guidance; ▪ Soil Management Plan; ▪ Site Waste Management Plan; ▪ Materials Management Plan; ▪ Stakeholder communication plan and complaint management; ▪ Environmental control measures to address construction effects such as noise and vibration, air quality and dust, light, water, ground conditions and contamination, climate change risks; and ▪ Emergency plans (e.g. flood risk, extreme weather, pollution).	
T2	**Outline Construction Traffic Management Plan (CTMP)** Outline CTMP that secures a detailed CTMP(s) which must include details of the following: ▪ Details of proposed vehicle routing, including implementation of appropriate signage; ▪ Traffic management requirements including crossings of PRoWs and any temporary diversions; ▪ Delivery procedures and protocols; ▪ Travel Plan measures to encourage site operatives to use sustainable modes of transport; ▪ Management practices to ensure off-site roads always remain clean and clear of debris during the works; ▪ Procedures for loading and transportation of contaminated material in line with relevant legislation; and ▪ Procedures relating to Abnormal Indivisible Load (AIL).	Approval of Outline CTMP submitted with planning application. Final detailed CTMP (s) will be subject to planning condition.
T3	**Site Investigation and Remediation Strategy** Contamination risks are identified as low although some risks are identified in relation to chalk cavities and chalk mining. Detailed design will therefore be informed by intrusive site investigation and an appropriate remediation and geotechnical design measures which could be secured by planning condition. Ground investigation(s) works to inform detailed design would be undertaken in accordance with BS 8485: 2015+A1:2019, as appropriate. A Remediation Strategy would outline site-specific remedial activities (if deemed necessary following ground investigation works), and submission to SADC for approval prior to works commencing.	Planning condition

ID No.	Mitigation Measure(s)	Anticipated Securing Mechanism
T4	**Outline Landscape and Ecological Management Plan (LEMP)** An Outline LEMP will accompany the planning application and forms the framework that will ensure the intent of the Development's landscape design and mitigation is realised. Thie OLEMP would inform the subsequent detailed design of the Development's landscaping proposals and guide the preparation of detailed LEMPs the future. Detailed landscaping proposals, submitted through reserved matters applications, will be required to demonstrate how they are contributing to the achievement of the objectives of the LEMP and the measures included. The Outline LEMP will be prepared with reference to the 'Biodiversity – Code of Practice for Planning and Development British Standard: BS 42020:2013' (BSI Standards Limited, 2013) and relevant sections which provide details on the content of the management plans.	Approval of Outline LEMP submitted with planning application. Final detailed LEMP(s) will be subject to planning condition.

Appendix 4.2 – Structure of ES Technical Chapters

Introduction

A brief summary of what is considered in the chapter and will state the author and/or relevant technical contributor and their competence.

Legislation, Planning Policy and Guidance

A summary of the relevant planning policy, legislation and guidance that forms the context for the topic in bullet point form to minimise length. A detailed review of policy is not required by the EIA Regulations.

Assessment Methodology

An explanation of methods used in undertaking the technical assessment and the prediction of effects. Reference will be made to published standards, professional guidelines and best practice of relevance to the topic.

A description of any topic-specific significance criteria applied in the assessment, particularly where these differ from common or generic criteria applied elsewhere in the ES. However, wherever possible, a common scale and language for assessing effects will be applied.

Consultation undertaken as part of the assessment to agree scope or methodology will be set out in the chapter. The chapter will describe the assumptions and limitations relevant to the assessment.

Baseline Conditions

A description of the environmental conditions that exist in the absence of the Development both now and, where relevant, those that are projected to exist in the future will be provided. The results of baseline surveys and desktop research will be summarised in this section.

A description of receptors relevant to the specific topic-based effects (e.g. noise, air quality) will be provided, together with an indication of the relative sensitivity of these receptors to such effects. Comment will also be made on the future baseline conditions as required by the EIA Regulations.

Embedded Mitigation

The embedded design and / or management mitigation measures (i.e. primary or tertiary) that will form part of the Development to avoid, prevent, reduce or offset environmental effects. These measures will be clearly defined to ensure transparency and to ensure that the impact assessment does not assess a scenario that is unrealistic in practice.

Construction

This section will present the assessment of potential effects/ impacts that are predicted to occur during the construction phase. Mitigation measures, over and above those included in the Outline CEMP will also be presented, together with residual effects.

Completed Development

This section will present the assessment of potential effects that are predicted to occur once the Development is complete and occupied together with the mitigation and residual effects.

Cumulative Effects

This section will present the assessment of potential cumulative effects with other projects in the vicinity that are predicted to occur during both the construction and completed Development phases together with the mitigation and residual effects.

Summary

This section will include a tabulated summary of the potential effects, mitigation measures and residual effects. The potential mechanisms by which the proposed mitigation measures will be implemented (e.g. CEMP, specific planning conditions or Section 106 obligations) will be specified, where appropriate.

Appendix 6.1 – Human Health Scoping Assessment

1 Human Health

1.1 In line with EIA Regulations[1], the impacts of human health will be assessed within the EIA process in relation to the Proposed Development. The EIA Regulations also require that any assessment should be proportionate to the project being considered.

1.2 It should also be noted that a standalone Health Impact Assessment (HIA) will be prepared as part of the suite of documents submitted as part of the planning application.

Baseline Conditions

1.3 The Site is currently in agricultural use. It is adjacent to the north-eastern edge of the settlement of Hemel Hempstead and to the south-west of the village of Redbourn. It is within the Redbourn ward in the administrative boundary of the St Alban's City and District Council (SADC).

1.4 Census data records the self-reported health status of the population. In 2021, 85% residents living in the Redbourn ward were recorded as being very good or good health. This compares to 88% for SADC and 83% for the East region as a whole.

Assessment Methodology

Potential Significant Effects

1.5 In line with IEMA Guidance on Effective Scoping of Human Health in Environmental Impact Assessment (2022)[2], the assessment of human health will focus on any relevant significant residual adverse effects identified through the wider EIA process which could have an impact on human health at the population level (determined by the study areas of each assessment and/or the extent of potential likely significant effects identified on receptors, combined). Only where a significant residual adverse effect has been identified elsewhere in the EIA process will the potential health effect be assessed. This will be undertaken at a general population level and vulnerable groups level[3] and will follow the standard approach to sensitivity, magnitude and significance.

1.6 At this stage in the application process, it is not possible to anticipate the likely significant residual effects arising from the proposals. However, Table 1 below sets out the wider determinants of health – as identified in the IEMA guidance[4] – and considers the likelihood of potential significant health effects of each in turn. The scope of the health chapter will be kept under review once the other technical chapters are completed.

[1] HMSO, (2017); The Town and Country Planning (Environmental Impact Assessment) Regulations 2017 (as amended)
[2] Institute of Environmental Management and Assessment, (2022); Effective Scoping of Human Health in Environmental Impact Assessment.
[3] Vulnerable groups are those considered to be particularly sensitive to changes in environmental and socio-economic factors (both adversely and beneficially) whereby they could experience disproportionate effects of health when compared to the general population. This includes: the elderly, young children, unborn children and their mothers, socio-economically deprived; unemployed etc.
[4] Institute of Environmental Management and Assessment, (2022); Effective Scoping of Human Health in Environmental Impact Assessment.

1.7 It is expected that the health assessment will draw on the conclusions of several inter-related disciplines including (but not necessarily limited to): Air Quality; Transport; Noise and Vibration; Agricultural Land and Soils; and Socio-Economics.

Table 1: Proposed Development in the context of the Wider Determinants of Health

Wider Determinants of Health		Considerations
Health Related Behaviours	Physical Activity	The Development will provide new areas of strategic and local open space including sports facilities, managed woodland and ecological network links that preserve and enhance connections to existing and future proposed built areas. In addition, a substantial new 'Significant Publicly Accessible Green Area' will be created providing facilities for new and existing communities. Collectively, these features could help to encourage physical activities and positive health related behaviours. Active travel measures will also be incorporated which will promote physical activity. Further consideration of such measures is provided under the relevant sections below.
	Risk-Taking Behaviours	Prior to the commencement of construction works on-site and during the construction phase a Construction Environmental Management Plan (CEMP) will be prepared (to be secured through an appropriately worded planning condition) and implemented which will include measures to ensure the safety of staff working on site as well as measures to reduce the risk to the general public. The CEMP will also require a Construction Method Statement (CMS) to be prepared by the Principal Contractor – it will be the site manager's responsibility to ensure construction staff are appropriately trained to minimise the risk of accidents, injuries and risk-taking behaviour whilst works are occurring on site. At the operational stage, the proposed uses are not expected to support risk taking behaviours. General risk-taking behaviours are specific to individual personal characteristics and to a degree to social behaviour. The extent to which planning and development can have an effect on human behaviour is limited beyond the influence of good design and mix of uses. Overall, the Development is not expected to have a significant effect upon risk-taking behaviour at the population level.
	Diet and Nutrition	The Development will deliver a new local centre which will include Class E floorspace which could be occupied by retail uses selling fresh food such as a café. The Development will not include any sui generis floorspace intended for hot food takeaway uses. Overall, the Development is not expected to have a significant effect upon diet and nutrition at the population level.
Social Environment	Housing	The proposed homes will be designed to national space standards and will be accessible and adaptable in line with building regulations. Delivery of new high-quality homes (including affordable provision) is likely to have a beneficial effect on health, meeting local housing needs, but at the population level such effects are unlikely to be significant.
	Relocation	The Site is currently in agricultural use. This use will be lost from the Site as a result of the Development. The loss of the existing agricultural uses from the Site will be considered within the Agricultural Land and Soils ES chapter. There are no other existing uses on site, therefore there is no need for consideration of relocation.
	Open Space, Leisure and Play	As noted above (see Health-Related Behaviours), new open space and play space will be delivered to meet demands arising from the Development – this will help to encourage physical activity and social interaction – both of which are linked to better health outcomes. The Socio-Economic ES chapter will include an assessment of the

		proposed open and play space provision. Whilst use of these spaces are likely to be beneficial to health, the scale of provision is unlikely to have a significant health effect at the population level.
	Transport modes, access and connections	The design of the Development is being informed by detailed transport assessment. Active travel will be encouraged with cycle parking and pedestrian and cycle infrastructure prioritised across the site. A Travel Plan will be prepared establishing measures to encourage use of sustainable modes of transport. These measures are likely to have a beneficial effect on health, however this is unlikely to be significant at the population level. The Development also has the potential to increase traffic levels on local roads, increase severance, create fear and intimidation, and increase risk of accident/injury. These aspects could have a potentially adverse effect on health. The ES Transport Chapter will be reviewed and its conclusions considered.
	Community safety	The Development will bring people to an area that is currently uninhabited. As such, there will be increased opportunities for crime. However, that will be offset through good design principles e.g. increased activation of the Site at different times of the day through provision of a mix of uses. The Development will be designed in line with secured by design principles in a Development Specification document to promote community safety. The net effects on population health are not likely to be significant.
	Community identity, culture, resilience and influence	The planning and design process includes extensive community and stakeholder engagement to ensure community needs are met. This includes consideration of community development measures to ensure the new neighbourhood develops its own identity and culture, and sufficient resilience is built in through provision of community spaces where needed. These measures are likely to have a positive effect on health but are unlikely to be significant at the population level.
	Social participation, interaction and support	The Development will provide spaces for social mixing such as areas of high-quality open space and public realm and community and recreation floorspace. As set out above, community development measures will be considered to ensure the new neighbourhood develops cohesively with appropriate support and social networks. Whilst these measures are important and likely to result in positive health effects as well as reducing negative health effects, they are unlikely to have a significant effect on health at the population level.
Economic environment	Education and training	The proposals include provision of a new primary school (up to 630 places/3FE). The Socio-Economics ES chapter will include an assessment of demand for school places assessed against existing and projected future capacity in local schools, and new proposed provision. Human health effects at the population level related to education are therefore unlikely to be significant.
	Employment and income	The Development will include non-residential floorspace which will be located in a new local centre. It is envisaged that this floorspace will support a range of employment opportunities. Whilst jobs can support beneficial health outcomes, the scale of non-residential floorspace proposed is unlikely to have a significant health effect at the population level.
Bio-physical environment	Climate change and adaption	The Development is being designed in line with latest requirements and guidance to minimise greenhouse gas emissions and ensure appropriate adaption to climate change. Design measures will be incorporated to minimise the risk of buildings overheating and to reduce the impact of extreme weather events e.g. use of SuDS to minimise flood risk. As a result, the Development is unlikely to have a significant effect on health in relation to climate change.
	Air quality	The Air Quality ES Chapter will consider impacts of the Development on air quality. If deemed necessary, mitigation will be identified to

		minimise impacts. As such the residual effects which could impact on human health at the population level are unlikely to be significant. However, the health chapter will draw on the conclusions from the Air Quality topic and if relevant, carry out an assessment on the effects on health.
	Water quality or availability	During construction, best practice measures will be implemented to ensure the risk of pollutant spillage is minimised as far as possible. These management measures will form part of the CEMP. At the operational stage, the proposed uses are not expected to result in the release of pollutants. An assessment of water resources and flood risk will be undertaken as part of the EIA which will identify mitigation measures if necessary. To manage water availability, water efficient fittings will be incorporated across the proposed development. With these measures in place, impact to human health at the population level are not expected to be significant.
	Land quality	The Agricultural Land and Soils and Water Resources and Flood Risk ES chapters will consider any impacts associated with land quality. Mitigation will be identified if necessary. The residual effect on health at the population level is unlikely to be significant. However, the health chapter will draw on the conclusions of the standalone Ground Conditions and Contamination report and, if relevant, carry out an assessment on the effects on health.
	Noise and vibration	Noise and vibration will be managed during the construction works through best practice measures as part of the CEMP. With this mitigation in place, the construction phase is unlikely to have a significant health effect at the population level. Operational noise impacts from the Development are expected to be limited given the nature of the proposed uses. The design of the Development will be informed by the noise and vibration assessment to ensure suitable noise levels are achieved for occupants in the context of existing surrounding uses. Mitigation measures will be incorporated if necessary, such as enhanced glazing. As such residual effects which could impact on human at the population level are not likely to be significant. However, the health chapter will draw on the conclusions of the Noise topic and, if relevant, carry out an assessment on the effects on health.
	Radiation	No impacts from radiation are expected to arise as a result of the Development.
Institutional and built environment	Health and social care services	The Socio-Economic ES chapter will include an assessment of demand for GP services. Mitigation will be identified if necessary. The residual effect on health at the population level is unlikely to be significant.
	Built environment	The Proposed Development will deliver approximately 1,500 new homes (including specialist accommodation such as extra-care schemes, a nursing home, and supported living units for people with disabilities) and a range of non-residential floorspace uses alongside new areas of strategic and local open space and public realm. Different uses and areas of the Site would be linked by a carefully designed network of roads and walking and cycling routes. These routes would also provide connections with existing and future communities in the surrounding area. The buildings and public realm are being designed in accordance with latest standards, regulations and guidance to ensure they are high quality and accessible. This includes consideration to inclusive design principles. Based on this, the Development is unlikely to have a significant effect on health at the population level.
	Wider societal infrastructure and resources	As set out above, the Development will provide a range of uses and/or mitigation as necessary to support the new neighbourhood. Effects on health are expected to be beneficial but not significant at the population level.

Assessment Approach

1.8 The assessment would take the following format:

- Policy context;
- Health-focused baseline profile (drawing on publicly available information from the Office for National Statistics (ONS); Office for Health Improvement and Disparities (OHID); and any local evidence base;
- Identify any local health priorities (as set out in the relevant Joint Strategic Needs Assessment (JSNA) and informed through consultation with the Healthy Places team at Hertfordshire County Council);
- Consider relevant health pathways in the context of the wider determinants of health and with particular focus on any significant residual adverse effects identified elsewhere in the EIA process; and
- Summary of the Development's potential effect on health.

Appendix 13.1 – Archaeological Desk Based Assessment

ARCHAEOLOGICAL DESK-BASED ASSESSMENT

LAND AT HEMEL HEMPSTEAD ROAD (B487), HEMEL HEMPSTEAD

794-PLN-HER-01242
Archaeological Desk-Based Assessment
Hemel Hempstead
Version 3.1
March 2025

Document status

Version	Purpose of document	Authored by	Reviewed by	Approved by	Review date
1.0	Draft	AJ	SM	SM	17.02.2025
1.1	Final Draft	AJ	SM	SM	25.02.2025
1.2	Final – issued to client	AJ	SM	SM	28.02.2025
2.0	Final – following client review	AJ	SM	SM	11.03.2025
3.0	Final – following red line update	AJ	SM	SM	26.03.2025
3.1	Final – following red line update & SM review	AJ	SM	SM	26.03.2025

Approval for issue

Simon Mortimer		26 March 2025

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Prepared for:

Pigeon (Hemel Hempstead) Limited & Bloor Homes

EXECUTIVE SUMMARY

This Archaeological Desk Based Assessment has been prepared by RPS, for Pigeon (Hemel Hempstead) Limited & Bloor Homes, for c.152.41 ha of land located north of Hemel Hempstead Road, Hemel Hempstead, Hertfordshire (centred at National Grid Reference TL 084 106).

This desk-based assessment updates the report submitted to the planning archaeologist and Historic England on 20th March 2025 in response to a change in the application boundary from 112ha to 152.41ha and further to receipt of initial comments on the submitted documents. The application area allows for a sizeable area of Suitable Alternative Natural Greenspace (SANG). Figure 1 shows the extent of the Site's allocation (shaded blue), which is the focus for any built development, and includes a significant green buffer/corridor along its eastern edge. The western area of the Site is proposed for allocation for residential development as part of one of the North and East Hemel Hempstead Growth Areas, within the Hemel Garden Communities (HGC) Delivery Statement (site reference H1). This forms part of a wider area of allocation to the east, north-east and north of Hemel Hempstead.

This document has been prepared in compliance with the National Planning Policy Framework, local planning requirements and relevant guidance documents. A separate Built Heritage Statement has been prepared to assess any impact upon built heritage assets within the vicinity of the Site (RPS 2025).

There are no designated heritage assets located within the Site. One Scheduled Monument, Aubreys Camp a defensive enclosure likely dating to the Iron Age, is located c.200m to the east, below the Site in the bottom of a valley. There is no clear intervisibility between the Site and the Scheduled Monument, which is surrounded by dense planting. The valley location of the Monument evidences the fact that the Site has not historically made a positive contribution to the Monument's significance, a fact reinforced by the lack of any obviously Iron Age/Roman settlement remains identified on the geophysical survey undertaken across the Site. Though Iron Age features were previously identified at Great Revel End farm, these are located within the proposed SANG, and are therefore unlikely to be impacted by the proposed development.

The proposed development, which allows for a green buffer at the western extent of the Site, will have no direct or indirect impacts upon the Scheduled Monument or its setting and significance. A meeting is scheduled in April 2025 with the planning archaeologist and Historic England to talk through initial comments made by both parties to the submitted heritage information. This is likely to lead to the production of a detailed Setting Assessment relating to the Scheduled Monument of Aubreys Camp.

The Site contains 12 HER entries. cropmarks (likely to be of Post Medieval or later dater), Great Revel End Farm itself and the remaining seven associated with surface finds. These are detailed below.

There are 12 HER entries within the Site. These relate to the Late Iron Age features at Great Revel End Farm, Medieval earthworks to the north of the farm associated with a deserted medieval village, cropmarks of field boundaries (likely to be post-Medieval or later in date), with the remainder consisting of surface finds dating from the Late Iron Age to Modern period (including a late Bronze Age socketed axe). Geophysical surveys of the Site (2019 and 2025) have identified very few anomalies of obvious archaeological interest relative to the size of the Site. These comprise possible Medieval to Post Medieval enclosures/housing platforms close to the deserted medieval village, probable Post Medieval structure within the south-western area, a number of short ditch lengths of unclear date; Post Medieval to Modern quarry pits and a set of World War II camp huts. The geophysical survey was carried out prior to the extension of the red line boundary, and therefore, does not include the c.7.5 ha field in the south-eastern corner of the Site.

Fieldwork undertaken locally, in particular across a c. 320 ha application area to the south, has identified unenclosed Bronze Age and earlier Iron Age settlement, apparently favouring locations close to dry-valleys and some evidence for Romano-British field systems. The current application area is assessed to have an enhanced potential for remains of these periods – in particular around the dry valleys that cross the Site and also in the vicinity of Great Revel Farm – where a burnt surface has been previously recorded. Such remains are likely to be of local interest.

Elements of the Site's perimeter and c. 6 lengths of the hedging within the Site, qualify as 'important hedgerows' as per *The Hedgerow Regulations 1997*.

There are no obvious archaeological constraints to the Site's development and it is unlikely that the Site will contain any archaeological remains that will need to be preserved in-situ or to be designed around. The planning archaeologist will require a scheme of archaeological trial trenching to test the geophysical anomalies, verify the veracity of the geophysical survey and confirm the Site's archaeological potential. The trial trenching, and the need for any additional geophysical survey, will be discussed with the planning archaeologist and Historic England in a site meeting scheduled for April 2025.

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1 INTRODUCTION AND SCOPE OF STUDY

1.1 This Archaeological Desk Based Assessment has been prepared by RPS, for Pigeon (Hemel Hempstead) Limited & Bloor Homes, for c.152.41 ha of land located north of Hemel Hempstead Road, Hemel Hempstead, Hertfordshire (centred at National Grid Reference TL 084 106 - Figure 1).

1.2 This desk-based assessment updates the report submitted to the planning archaeologist and Historic England on 20th March 2025 in response to a change in the application boundary from 112ha to 152.41ha and further to receipt of initial comments on the submitted documents. The application area allows for a sizeable area of Suitable Alternative Natural Greenspace (SANG). Figure 1 shows the extent of the Site's allocation (shaded blue), which is the focus for any built development, and includes a significant green buffer/corridor along its eastern edge. The western area of the Site is proposed for allocation for residential development as part of one of the North and East Hemel Hempstead Growth Areas, within the Hemel Garden Communities (HGC) Delivery Statement (site reference H1). This forms part of a wider area of allocation to the east, north-east and north of Hemel Hempstead.

1.3 The western area of the Site is proposed for allocation for residential development as part of one of the North and East Hemel Hempstead Growth Areas', within the Hemel Garden Communities (HGC) Delivery Statement (site reference H1). This forms part of a wider area of allocation to the east, north-east and north of Hemel Hempstead. The allocated land within the Site is highlighted on Figure 1. To the east of the allocated land, an area of Suitable Alternative Natural Greenspace (SANG) is proposed. No development is proposed beyond the allocated and SANG areas, though final extent of the SANG areas is yet to be determined. A parameters plan is provided in Appendix 2.

1.4 The Site comprises two parcels of land, one containing nine fields and Great Revel End Farm to the north of Little Revel End (road), and the second containing three fields to the south of the road. The fields within the Site are partitioned by mixed mature and immature hedgerows, in places interposed with mature trees, and modern post-and-wire fencing. The Site is bound by Holtsmere End Land to the west and by Hemel Hempstead Road to the south. To the east, the Site is bound by Betts Cottages, North Barn, Pancake Wood, residential dwellings and an enclosed field. Gaddensden Lane and Holtsmere End Lane are located north of the Site. The former farm Little Revel End, North Barn and Betts Cottages are enclosed by the red line boundary but not located within it.

1.5 This Archaeological Desk-Based Assessment has been prepared in compliance with the National Planning Policy Framework, local planning requirements and the Chartered Institute for Archaeologists' '*Standard and Guidance for Historic Environment Desk-Based Assessment*' (CIfA 2020), to identify and provide a description of the archaeological potential of the Site, the significance of the identified heritage assets and the likely effects of the proposed development.

1.6 To achieve this, a review and examination of evidence obtained from the Hertfordshire *Historic Environment Record* (HER), Historic England's *National Heritage List for England* (NHLE), online resources and historic mapping from the late 18th century was carried out. A site walk-over survey and a visit to the Hertfordshire Archives & Local Studies was carried out on 22nd January 2025.

1.7 The Site is located c.200m to the west of The Aubreys Camp Scheduled Monument (List Entry 1003520). This report provides a description of the Scheduled Monument and assesses its significance and the potential impacts of the proposed development – in a manner that was considered to be proportionate to the likely development impact. However, following initial comments received from Historic England a meeting will be convened on site to address concerns raised with the submitted information. The meeting will establish the need for a more detailed

Setting Assessment of Aubreys Camp Scheduled Monument; the need for and scope of any further geophysical survey and the need for, sample size and timing of any trial trenching. A separate Built Heritage Statement has been prepared to assess any impact upon built heritage assets (RPS 2025).

1.8 Two geophysical surveys of the Site have been undertaken (Magnitude Surveys 2019 & MOLA 2025). The 2019 geophysical survey was completed, along with an Archaeological Desk-Based Assessment (Oxford Archaeology 2019), to support the Site's previously proposed allocation in the withdrawn St Alban's Local Plan. The geophysical survey covered the western 20.8ha of the southern parcel. The 2025 geophysical survey, carried out to support this application, was carried out prior to the extension of the red line boundary, and therefore, does not include the c.7.5 ha field in the south-eastern corner of the Site.

1.9 The results of this study enables relevant parties to identify any necessary further evaluation and/or mitigation measures.

2 PLANNING BACKGROUND AND DEVELOPMENT PLAN FRAMEWORK

2.1 National legislation regarding archaeology, including scheduled monuments, is contained in the Ancient Monuments and Archaeological Areas Act 1979, amended by the National Heritage Act 1983 and 2002, and updated in April 2014.

2.2 In March 2012, the government published the National Planning Policy Framework (NPPF), which was most recently updated in December 2024. The NPPF is supported by the National Planning Practice Guidance (NPPG), which was published online 6th March 2014 and has since been periodically updated. (https://www.gov.uk/government/publications/national-planning-policy-framework--2)

2.3 The NPPF and NPPG are additionally supported by three Good Practice Advice (GPA) documents published by Historic England: GPA 1: The Historic Environment in Local Plans; GPA 2: Managing Significance in Decision-Taking in the Historic Environment (both published March 2015). The second edition of GPA3: The Setting of Heritage Assets was published in December 2017.

National Planning Policy

2.4 Section 16 of the NPPF, entitled Conserving and enhancing the historic environment provides guidance for planning authorities, property owners, developers and others on the conservation and investigation of heritage assets. Overall, the objectives of Section 16 of the NPPF can be summarised as seeking the:

- Delivery of sustainable development;
- Understanding the wider social, cultural, economic and environmental benefits brought by the conservation of the historic environment;
- Conservation of England's heritage assets in a manner appropriate to their significance; and
- Recognition that heritage makes to our knowledge and understanding of the past.

2.5 Section 16 of the NPPF recognises that intelligently managed change may sometimes be necessary if heritage assets are to be maintained for the long term. Paragraph 207 states that planning decisions should be based on the significance of the heritage asset and that level of detail supplied by an applicant should be proportionate to the importance of the asset and should be no more than sufficient to review the potential impact of the proposal upon the significance of that asset.

2.6 *Heritage Assets* are defined in Annex 2 of the NPPF as: a building, monument, site, place, area or landscape positively identified as having a degree of significance meriting consideration in planning decisions. They include designated heritage assets (as defined in the NPPF) and assets identified by the local planning authority during the process of decision-making or through the plan-making process.

2.7 Annex 2 also defines *Archaeological Interest* as a heritage asset which holds or potentially could hold evidence of past human activity worthy of expert investigation at some point.

2.8 A *Designated Heritage Asset* comprises a: World Heritage Site, Scheduled Monument, Listed Building, Protected Wreck Site, Registered Park and Garden, Registered Battlefield or Conservation Area.

2.9 *Significance (for heritage policy)* is defined as: The value of a heritage asset to this and future generations because of its heritage interest. This interest may be archaeological, architectural,

artistic or historic. Significance derives not only from a heritage asset's physical presence, but also from its setting.

2.10 *Setting* is defined as: The surroundings in which a heritage asset is experienced. Its extent is not fixed and may change as the asset and its surroundings evolve. Elements of a setting may make a positive or negative contribution to the significance of an asset, may affect the ability to appreciate that significance or may be neutral.

2.11 In short, government policy provides a framework which:

- Protects nationally important designated Heritage Assets;
- Protects the settings of such designations;
- In appropriate circumstances seeks adequate information (from desk based assessment and field evaluation where necessary) to enable informed decisions;
- Provides for the excavation and investigation of sites not significant enough to merit *in-situ* preservation.

2.12 The NPPG reiterates that the conservation of heritage assets in a manner appropriate to their significance is a core planning principle, requiring a flexible and thoughtful approach. Furthermore, it highlights that neglect and decay of heritage assets is best addressed through ensuring they remain in active use that is consistent with their conservation. Importantly, the guidance states that if complete, or partial loss of a heritage asset is justified, the aim should then be to capture and record the evidence of the asset's significance and make the interpretation publicly available. Key elements of the guidance relate to assessing harm. An important consideration should be whether the proposed works adversely affect a key element of the heritage asset's special architectural or historic interest. Additionally, it is the degree of harm, rather than the scale of development, that is to be assessed. The level of 'substantial harm' is considered to be a high bar that may not arise in many cases. Essentially, whether a proposal causes substantial harm will be a judgment for the decision taker, having regard to the circumstances of the case and the NPPF. Importantly, harm may arise from works to the asset or from development within its setting. Setting is defined as the surroundings in which an asset is experienced and may be more extensive than the curtilage. A thorough assessment of the impact of proposals upon setting needs to take into account, and be proportionate to, the significance of the heritage asset and the degree to which proposed changes enhance or detract from that significance and the ability to appreciate it.

2.13 In considering any planning application for development, the planning authority will be mindful of the framework set by government policy, in this instance the NPPF, by current Development Plan Policy and by other material considerations.

Local Planning Policy

2.14 Local Planning Policy for the Site is currently provided by St Albans City and District Council's *City and District of St Albans District Local Plan Review 1994 (Adopted 30 November 1994): Saved and Deleted Policies Version (July 2020).*

2.15 The Site falls within the Redbourn Neighbourhood Plan 2020-38 (made January 2023).

2.16 A new local plan is currently being developed by St Albans City and District Council. It is currently at examination stage, with an aim for adoption, being March 2026. The Site is proposed for allocation as within one of the 'North and East Hemel Hempstead Growth Areas', within the Hemel Garden Communities (HGC) Delivery Statement (Policy H1). A Heritage Impact Assessment (Place Services 2024) was carried out in support of the allocation. The report conclusions regarding H1 is summarised in Chapter 4.

2.17 Specific policy regarding heritage which is relevant to this assessment is quoted below:

City and District of St Albans District Local Plan Review 1994 (Adopted 30 November 1994): Saved and Deleted Policies Version (July 2020)

POLICY 109 SCHEDULED ANCIENT MONUMENTS

Planning applications for development which would adversely affect a Scheduled Ancient Monument, as defined on the Proposals Map and listed below, will be refused on archaeological grounds unless prior scheduled monument consent (1) has been obtained from the Secretary of State for the Environment, If scheduled monument consent has been granted, the District Council will seek to preserve the amenity of ancient monuments by resisting proposals within scheduled areas which would detract from their character. The following are Scheduled Ancient Monuments:

SITE REF.	*p.m.(2)*	*E.H.(3)*	*LOCATION*
AM.2	*1*	*2*	*The Aubreys Camp, Redbourn*

POLICY 111 ARCHAEOLOGICAL SITES WHERE PLANNING PERMISSIONS MAY BE SUBJECT TO A RECORDING CONDITION

Within the sites listed below and defined on the Proposals Map, the District Council will not normally refuse planning applications on archaeological grounds. However, following evaluation, planning permissions may be subjected to a condition requiring facilities for the Council to record remains by excavation in advance of construction and/or during construction. The evaluation, which may involve limited excavation or other work (eg. geophysical survey), is to be carried out by the Council or an archaeologist approved by the Council. Voluntary agreements will be sought (e.g. under Section 106) to cover the cost of work, including any initial evaluation, and to ensure that finds made during the course of such work are donated to the Council.

LIST OF ARCHAEOLOGICAL SITES WHICH MAY BE SUBJECT TO A RECORDING CONDITION

SITE REF	*PROPOSALS MAP SHEET*	*LOCATION*
AS.R.6	*1*	*Area around the Aubreys, Redbourn*

Redbourn Neighbourhood Plan 2020-38

POLICY RED 12: NON-DESIGNATED HERITAGE ASSETS

1. Development proposals shall protect or enhance non-designated heritage assets which contribute to the heritage significance of Redbourn. Non-designated heritage assets include those on the Local List published by St Albans City and District Council and listed in Table 1. The retention and protection of these non-statutory heritage assets must be appropriately secured:

a) All new development shall conserve or enhance any affected non-designated heritage assets taking into consideration its significance and in line with the provisions of the NPPF.

b) Any development proposals that would affect any of the non-statutory heritage assets, including development within their setting, should be supported by an appropriate heritage statement to enable a balanced judgement regarding the scale of any harm to the significance of the heritage asset.

PROJECT RED H: PROMOTION OF LOCAL HISTORY

1. The Parish Council will investigate the potential for introducing heritage plaques, information boards and posters around Redbourn, which would include information on the history of local

buildings, sites, monuments and past events, drawing upon the County Council's Historic Environment Record and other sources of information.

2. The Parish Council will work with partners, including the Friends of the High Street, Redbourn Village Museum and St Albans and Hertfordshire Architectural and Archaeological Society, to develop ideas for the project, which might extend to a heritage trail around Redbourn

2.18 In line with relevant planning policy and guidance, this Archaeological Desk-Based Assessment seeks to clarify the Site's archaeological potential and the likely significance of that potential and the need or otherwise for additional evaluation or mitigation measures.

3 GEOLOGY, TOPOGRAPHY & SITE VISIT AND HISTORIC LANDSCAPE CHARACTER

Geology

3.1 The British Geological Survey (BGS) 1:50,000 mapping records the solid geology across the Site as chalk belonging to the Lewes Nodular Chalk Formation and Seaford Chalk Formation (https://geologyviewer.bgs.ac.uk/ - accessed 17.02.2025).

3.2 Superficial deposits of clay, silt, sand and gravel (Clay-With-Flints Formation) are located on the higher areas of the Site (ibid.). In the lower, south-eastern area of the site, head deposits of clay, silt, sand and gravel representing hillwash and soil creep deposits, are recorded (ibid.). These follow two dry valleys, one orientated south-west/north-east roughly following Hemel Hempstead Road, and the second east/west following Gaddesden Lane – both leading towards the River Ver c.2km to the east.

3.3 The Cranfield Soil and Agrifood Institute identifies the soils across most of the Site as slightly acidic, loamy and clayey soils with impeded drainage (Soilscape 8; http://www.landis.org.uk/soilscapes/ - accessed 17.02.2025). Freely draining, slightly acidic but base-rich soils (Soilscape 7) are recorded above the head deposits, again, roughly following Hemel Hempstead Road, as well as Gaddesden Lane (ibid.).

Topography & Site Visit

3.4 The Site is gently undulating with a southeasterly trending slope, and four shallow, wide valleys, are located between areas of higher ground. The levels of the Site descend from c.135m Above Ordnance Datum (AOD) within its northwestern area, to c.101m AOD at its south-eastern end, alongside the Hemel Hempstead Road (B487). The LiDAR data (Figure 8) best shows the heights of the Site.

3.5 Four dry valleys are located within the Site, two orientated south-east/north-west, the third roughly follows Hemel Hempstead Road, and the fourth follows Gaddesden Lane. These are evident in the LiDAR data (Figure 8), and the magnetic responses within the geophysical survey data, which indicates colluvial deposits (hillwash) as shown on Figure 3.

3.6 A site visit was carried out on the 22nd January 2025 in fine but overcast weather conditions (Plates 1 – 11; Figure 18). The site visit was carried out prior to the expansion of the red line. Therefore, though all areas of the Site were accessible and no hitherto unknown archaeological features or earthworks were identified within the Site, areas within the current application boundary that were outside of that previously assessed were not visitedAn additional site visit will be carried out in April 2025, to assess these additional fields.

Historic Landscape Character

3.7 There are four different Historic Landscape Character (HLC) types recorded within the Site, which comprise:

- Pre-18th century Coaxial Enclosure (HHT6391, HHT6338 & HHT6342).
- Boundary loss (HHT3237, HHT6337 & HHT6341)
- 20th century enclosure (HHT6330, HHT6335 & HHT6334)
- Built-Up Areas – Urban Development (HHT6390)

3.8 For the most part, the fields represent late 20th - and 21st -century amalgamations, reflecting a substantial shift in agricultural practices and land management following the Second World War. Elements of an earlier pattern of enclosure remain legible in places within the Site, most particularly to its southeastern corner, albeit still subjected to amalgamation or modern reconfiguration of field boundaries. The HLC Data (Figure 7) shows these character types to be common to the north-east of Hemel Hempstead and south-west of Redbourn.

4 ARCHAEOLOGICAL WORK & NON-DESIGNATED HERITAGE ASSETS

4.1 A desk-based assessment (Oxford Archaeology 2019) supported by a geophysical survey (Magnitude Surveys 2019) was previously carried out for 20.8 ha within the southern part of the Site. This assessment reviews the results of the previous fieldwork and is supplemented by additional geophysical survey data (MoLA 2025). The 2025 survey was carried out prior to the extension of the red line boundary, and therefore, does not include the c.7.5 ha field in the south-eastern area of the Site.

4.2 As previously detailed, the western area of the Site is proposed for allocation (Site H1) as one of the 'North and East Hemel Hempstead Growth Areas', within the Hemel Garden Communities (HGC) Delivery Statement (shown on Figure 1). A Heritage Impact Assessment (Place Services 2024) was carried out to determine the Site's suitability for allocation. The assessment noted that the Site contains potential for Prehistoric, Roman and Medieval remains and concluded that the Site should be subject to a desk-based assessment, geophysical survey and trial trenching.

4.3 The results of the geophysical surveys are summarised below and shown on Figure 3:

- A roughly square, three-sided enclosure adjacent to Holtsmere End Land at the south-western area of the Site, covering an area of c.0.6 ha. Likely representing a building, with the magnetically enhanced spread surrounding and localised to the enclosure, highly likely caused by demolition rubble (Magnitude Surveys 2019, 10). The rubble spread's magnetic response corresponds with the response expected from fired or burnt material such as brick (ibid.). The structure is not visible on any mapping available to this report, however, the possible brick material indicates a Post Medieval date (Oxford Archaeology 2019, 18). A platform in this area is visible on LiDAR data (Figures 7 & 8) but this was not obvious during the site visit.
- Archaeological anomalies potentially representing enclosures or building platforms were identified to the north-east of Great Revel End Farm. which could be associated with the deserted medieval village or extended farmstead (6373) located close to the farm.
- Possible ditches were identified at the northern end of the Site.
- Short linear anomalies were identified within the western field, to the south and south-east of Great Revel End Farm, and in the south-eastern area of the Site (to the east of Little Revel End). The origin of these is uncertain but an archaeological origin cannot be discounted. Further uncertain anomalies were identified around the possible enclosures/building platforms. It is possible those close to Great Revel End Farm and the enclosures/building platforms, are associated with the farm itself, or potentially with the deserted medieval village.
- Anomalies in the southern area of the site, west of North Barn and Betts Cottage, correspond with military huts visible on the 1947 aerial photograph (Historic England photo ref. raf_cpe_uk_2135_rp_3371[1]).
- Quarry pits dating to the Post Medieval to Modern period. Three of these pits are depicted on the 1841 tithe map and 1883 – 1884 OS (Figures 13 - 14). The remainder are not visible on the available mapping. A number of hollows are identifiable in the LiDAR data which could be a result of shallow quarrying.

[1] Available online raf_cpe_uk_2135_rp_3371 - Aerial Photo | Historic England [accessed 23.01.2025]

- Narrow bands of natural responses were identified resulting from colluvium and/or head deposits within the valleys. A number of similar dry valleys/palaeochannels were identified during trenching to the south and unenclosed Bronze Age activity was identified on the valley slopes (paragraph 4.11).

4.4 Overall, the geophysical surveys have successfully identified areas of archaeological interest in the surveyed areas of the Site (building in the south-west and settlement features to the north of Great Revel End Farm). However, the trenching to the south of the Site (see para 4.11), encountered archaeological features that were not picked up in the geophysical survey (unenclosed settlement remains and field systems) and some features were masked by green waste.

4.5 The Site contains 12 HER entries. These represent Late Iron Age features, Medieval earthworks, cropmarks (likely to be of Post Medieval or later dater), Great Revel End Farm itself and the remaining seven associated with surface finds. These are detailed below.

4.6 A Late Bronze Age socketed axe (13091) was found at Great Revel End Farm. The HER data locates this within the north-western area of the Site. However, the HER entry links the axe to entry 12656, which references small quantities of Roman coins and Medieval to Post Medieval metalwork, found in the field north of Great Revel End Farm. The entry details for 13091 and 12657, notes that four trenches were excavated at the farm, targeting the location of the axehead which identified a shallow linear feature likely to be of natural origin and a large oval pit with an associated gravelled surface with elements of burnt stone (six sherds of Iron Age pottery were found from the silts overlying the surface). The pit contained struck Neolithic/Bronze Age flint flakes and a fragment of Prehistoric flint-gritted pottery. This is similar to other remains of this type found at Breakspear, over 1km south of the site, where Late Bronze Age/early Iron Age pits and a ditch were excavated (OA 2017, 2).

4.7 Earthworks of Medieval ridge and furrow, boundary ditches and possible house platforms (6373) are recorded north-east of Great Revel End Farm, and according to the HER entry, cover 13 hectares. These are possibly visible in the LiDAR data and geophysical anomalies identified in this area, are likely to represent enclosures/building platforms. This area originally lay outside of the site boundary at the time of the site visit. Therefore, it is uncertain if earthworks currently survive on Site. However, these will be reassessed after the site visit scheduled for April 2025.

4.8 Cropmarks of north-west/south-east aligned linears are visible on Google Earth imagery and recorded on the HER (16962) within the Site. These correspond with historic field boundaries illustrated on the 1841 tithe map. According to the HER entry, these may have fossilized Medieval headlands. These are visible on LiDAR data (Figure 8) but are imperceptible on Site. No corresponding anomalies were identified during the geophysical survey.

4.9 The extant Great Revel End Farm (12658) located at the northern end of the Site, which contains the Grade II Listed Farmhouse (List Entry 1102957) and Barn (List Entry 1295569), are addressed in the separate Built Heritage Statement (RPS 2025). These are not discussed further in this report, except where they may inform the Site's archaeological potential.

4.10 The HER also records six other surface finds have been recovered within the Site, which were recorded on the Portable Antiquities Scheme. There is little detail of these beyond the date, and given the little information provided, it is difficult to identify a corresponding find on the PAS website. These are tabulated below:

HER Reference:	Details
MHT32827	Middle Iron Age to Early Roman
MHT32831	Medieval
MHT33255	Late Roman

MHT36003	Medieval to Post Medieval
MHT36052	Post Medieval
MHT36053	Post Medieval

4.11 Geophysical survey (EHT8294) and two phases of archaeological evaluation trenching (not recorded on the HER; Oxford Archaeology 2017 & 2020) were carried out across 320 ha of land, located c.20m – 2.5km south of the Site, and comprised the excavation of 307 trenches. Trenches excavated c.70 – 100m south of the Site, encountered remains of two parallel east/west aligned Roman ditches – including three undated ditches that could be contemporary - and a late Medieval ditch (Oxford Archaeology 2020, 62; Figure 3). Other remains encountered comprised an undated quarry pit and a probable made ground deposit containing a mix of material including a small quantity of Roman, Medieval and Post Medieval pottery fragments. A Neolithic pit was located c.200m south of the Site but no other Neolithic features were recorded by the trenching. Two small Late Bronze Age pits indicating localised settlement activity and a set of Late Iron Age/Early Roman enclosures and possible industrial activity, were recorded c.600m – 700m to the south-east. An assemblage of Mesolithic/Early Neolithic flints were recovered from a Late Bronze Age boundary ditch, which itself was located close to contemporary postholes, pits and ditches representing extensive settlement, on the slopes of a dry valley/palaeochannel, c.1km to the south of the Site. Beyond the search area, an Early Roman settlement was recorded c.2.3km to the south, and Iron Age settlement was encountered c.3km to the south. These areas of archaeological activity are displayed on Figure 4.

4.12 In terms of verifying the accuracy of the geophysical survey, the features identified in the trenching that weren't apparent in the geophysics comprised discrete pits and postholes and shallow linear features (i.e. features that tend not be routinely identified in geophysical survey). The wider landscape is essentially sparsely settled, with no evidence for significant Iron Age/Roman settlement activity within 500m of the Scheduled Monument.

4.13 Archaeological monitoring (EHT9103) of groundworks c.280m east of the Site, did not encounter any significant archaeological remains.

4.14 A strip, map and sample excavation (EHT8326) carried out c.400m east of the Site at Aubrey Park Hotel, encountered remains of Post Medieval to Modern agricultural activity associated with the earlier farmstead (15130), but no archaeological remains pre-dating these periods.

5 ARCHAEOLOGICAL AND HISTORICAL BACKGROUND WITH ASSESSMENT OF SIGNIFICANCE

Timescales used in this report

Prehistoric

Palaeolithic	900,000	-	12,000 BC
Mesolithic	12,000	-	4,000 BC
Neolithic	4,000	-	1,800 BC
Bronze Age	1,800	-	600 BC
Iron Age	600	-	AD 43

Historic

Roman	AD 43	-	410
Saxon/Early Medieval	AD 410	-	1066
Medieval	AD 1066	-	1485
Post Medieval	AD 1486	-	1799
Modern	AD 1800	-	Present

Introduction

5.1 This chapter reviews the available archaeological evidence for the Site and the archaeological/historical background of the general area, and, in accordance with NPPF, considers the potential for any as yet to be discovered archaeological evidence on the Site.

5.2 What follows comprises a review of known archaeological and heritage assets within a 1km radius of the Site (Figures 2 & 5 - 6), also referred to as the search area, held on the NHLE and Hertfordshire Historic Environment Record (HER), together with a historic map regression exercise charting the development of the Site from the 18th century onwards until the present day (Figures 9 – 16).

5.3 Chapter 6 subsequently considers whether the proposed development will impact the theoretical archaeological potential identified below.

Designated Heritage Assets

5.4 There are no designated heritage assets recorded within the Site.

5.5 Aubreys Camp (Scheduled Monument List Entry1003520) is a partly single, partly double ditched enclosure, located c.200m to the east of the Site, set down from the higher ground at the bottom of valley and close to a tributary stream of the River Ver. The location of the camp is shown on Figure 8. Given its location within a valley and close to a small tributary of the River Ver, it is likely to have functioned as a focal point rather than a defensive enclosure (Place Services 2024, 31). The enclosure survives as earthworks. A previous, small excavation within the interior of the enclosure, proved inconclusive (ibid.). It is almost certainly of Iron Age date.

5.6 The assessment of the significance and potential impacts on designated built heritage assets and the conservation area does not fall within the scope of this report. These are addressed separately in the accompanying Built Heritage Statement (RPS 2025).

Prehistoric

5.7 There is no evidence for pre-Mesolithic activity within the search area recorded on the HER, and no Mesolithic activity, is recorded within the vicinity of the Site.

5.8 A pit, containing struck Neolithic/Bronze Age flint flakes and a fragment of Prehistoric flint-gritted pottery, was excavated at Great Revel End Farm. A gravelled surface with elements of burnt stone, and associated with the pit, was also recorded. Six sherds of Iron Age pottery were found from the silts overlying the pit. A Late Bronze Age socketed axe (13091) was previously found on the surface at the farm.

5.9 Elsewhere within the search area, an isolated Neolithic pit was encountered c.200m south of the Site, and Late Bronze Age/early Iron Age settlement features and finds, were encountered 1km to the south of the Site, located adjacent to a palaeochannel/dry valley.

5.10 Though the geophysical surveys of the Site identified limited archaeological anomalies, the trenching to the south encountered discrete features and shallow linears that were undetected by the survey (as is commonplace with geophysics, particularly since unenclosed scatters of pits and post holes primarily represent Late Bronze Age/Early Iron Age settlement in the region (Brudenell N.D.). The presence of the burnt and worked flints, the socketed axe and gravel surface at Great Revel End Farm and Late Bronze Age settlement features off site to the south, enhances the potential for unenclosed Late Bronze Age/Early Iron Age settlement to survive close to Great Revel End Farm and the dry valleys within the Site. A Neolithic pit was encountered c.200m to the south. Though this was the only Neolithic feature identified during the trenching, its proximity to the Site, means that further, isolated Neolithic pits to survive within the Site cannot be wholly discounted.

5.11 There is a moderate potential for Bronze Age remains, a high potential for Iron Age remains and a low potential for archaeological activity pre-dating the Bronze Age period. This is likely to comprise localised areas of Late Bronze Age/Early Iron Age features focused on the sides of the dry valleys and within the vicinity of Great Revel End Farm. The potential for Iron Age remains within the south-eastern field is unknown but is considered enhanced, given its proximity to The Aubreys Camp.

Roman

5.12 Two parallel agricultural ditches were encountered c.70 – 100m south of the Site, and enclosures were identified, c.600 – 700m to the south-east. A smally quantity of Roman coins were found at Great Revel End Farm but trenching at the farm did not encounter any Roman features.

5.13 The geophysical survey did not record any anomalies likely to represent Roman features. The extensive archaeological work to the south did not identify any evidence of Roman settlement close to the Site, with the nearest area of settlement comprising enclosures and possible industrial activity, located c.600 – 700m to the south-east.

5.14 The Site is considered to contain a low to moderate potential for Roman agricultural features (i.e. field boundaries) close to Hemel Hempstead Road, and low elsewhere on Site. The Site's potential for settlement dating to this period is low.

Early Medieval

5.15 The majority of the Early Medieval population of Hertfordshire lived in the north of the county, in large, nucleated villages (Bryant 2011). By the late 8th century, large areas of Hertfordshire were under the rule of King Offa (Mercia), and large estates were developed, including within the core of Hemel Hempstead (Bryant 2011 & Oxford Archaeology 2019).

5.16 There is no evidence for Early Medieval activity within the Site. There are no Early Medieval HER entries within the search area on the HER and no such activity was recorded by the trenching to the south.

5.17 The potential for Early Medieval archaeological remains is low.

Medieval

5.18 Both Redbourne (c.1.5km to the north-east) and Hemel Hempstead (c.4.5km to the south-west) are recorded in the 1086 Domesday Survey (Palmer, Powel-Smith 2019).

5.19 The geophysical survey identified a small quantity of probable linear features, located within the north-west, north and south-eastern areas of the Site. Those identified close to Great Revel End Farm in the northern area of the Site, could be associated with the possible deserted medieval village (6373), which was located north of Great Revel End Farm. Alternatively, the ditches could be associated with the modern Great Revel End Farm.

5.20 The deserted medieval village was first identified through aerial photography as low earthworks of ridge and furrow, boundary ditches and house platforms (6373). These earthworks are potentially visible in the LiDAR data but given this area lay outside of the original red line boundary, their survival was not confirmed by the site visit. Anomalies potentially representing Medieval or Post Medieval enclosures or house platforms were identified by the geophysical survey in the areas of the deserted medieval village, to the north of the farm.

5.21 The remaining areas of the Site would have comprised agricultural lands and were within the Medieval open field system (Featherstone 2001).

5.22 The Site's potential for Medieval settlement is high to the north of Great Revel End Farm, in the location of the earthworks (6373) and the geophysical anomalies of possible enclosures/building platforms. Boundary features are potentially located within the northern area of the Site, close to Great Revel End Farm, as represented by the linear geophysical anomalies (light blue on Figure 3). The remaining areas of the Site have a negligible to low potential for significant (i.e. non-agricultural) Medieval remains.

Post Medieval & Modern (including map regression exercise)

5.23 Linear cropmarks (16962) are recorded in the south-western area of the Site, which correspond with historic field boundaries depicted on the tithe map.

5.24 Remains of a probable Post Medieval structure were identified by the geophysical survey within the south-western area of the Site.

5.25 Remains of World War II huts were identified by the geophysical survey in the eastern area of the Site. These were previously known through historic aerial photographs. There is a possibility of buried ordnance in this area and any future investigation would need appropriate supervision.

5.26 An area marked 'Quakers Ground', postulated to represent a burial ground, (9664) is recorded c.30m south-west of Site. However, archaeological work within this field (geophysical survey and

evaluation trenching) did not encounter any significant archaeological remains (Oxford Archaeology 2017, 38).

5.27 The Post Medieval to Modern Little Revel End Farmhouse (18758) is located off site. A small building, likely a barn, is illustrated within the site boundary on the 1841 Tithe Map of Redbourne (Figure 13) but was demolished in the later 19th century. In its place, a pond was excavated, which would have destroyed remains of the building.

5.28 The earliest maps available to this assessment are the 1768 Survey of the Estate of Grimston (Figure 9) and the 1771 Plan of Land in Redbourne (Figure 10). Both of these maps are limited to the southern area of the Site, with the 1768 map, showing only the southernmost two plots adjacent to Hemel Hempstead Road. Neither provide a great amount of archaeological insight but the 1771 map does show a barn within the Site, associated with Little Revel End Farm.

5.29 The 1806 Ordnance Survey (OS) map (Figure 11) and the 1841 tithe map (Figure 12) shows the late 16th or early 17th Great Revel End Farm (12658) and a collection of buildings (farmhouse, stables and outbuildings) located to the south of the extant farmstead. These are recorded as 'homestead' within the tithe apportionment (plot 467). An L-shaped road leads to this farmstead from Little Revel End (lane). Concentrated magnetic disturbance was identified in the area of the 'homestead' farm' by the geophysical survey, which could be a result of the demolition of the farm buildings. It is difficult to identify any probable anomalies in this area because of the presence of a small area of planting that precluded survey. The farmstead is located within an area of the Site that is proposed for SANG.

5.30 On the 1806 map, the Site is shown containing 21 fields located in the northern area of the Site, and ten in the southern area. Three elongated fields west of Revel End could be relict Medieval strip fields. A small building, potentially a cottage, was located south of Little Revel End lane, in the northern end of the southern area of the Site.

5.31 The 1841 Redbourn Parish Tithe Map (Figure 12) shows the Site comprising all or part of 62 regular field enclosures. The pattern of enclosure shown by the mapping appears to demonstrate at least the partial enclosure of a former open-field system of agriculture, whereby some of the field boundaries appear irregular or curvilinear in form, following headlands or common features between what may have previously been sets (or furlongs) or ridge and furrow. Conversely, the greater part of fields featured regular, straight field boundaries, forming rectangular enclosures more typical of later post-medieval planned enclosure. Enclosure, particularly the later post-medieval planned enclosures, drastically transformed the nature, accessibility, and management of the country's agricultural landscape, with the imposition of hedging and other means of enclosure, and a shift in the way in which the land had previously been worked in common. The existing road network appears to have been extant by the 1840s, including Little Revel End Lane, Holtsmere End Lane, and the Hemel Hempstead Road.

Plot:	Owner/Occupier	Plot Name	Use
444	Lady Glamis / John Beaumont	Clap Gate	Arable
445	John Andrew Groome / James Fenn	Green Field	Arable
447		Long Field	Arable
448		Six Acres	Arable
449		Home Meadow	Grass
450		Under Acre	Grass
451		Long Meadow	Grass
452		Eight Acres	Arable
453		Dell	Wood
455		Great Field	Arable

456		Dell Field	Arable
457		Dell	Wood
458		Almonds	Arable
474		Burrow Field	Arable
475		[Little] Revel End	Homestead
476		Orchard	Grass
477		Dell Croft	Arable
478		Three Corners	Arable
479		Four Acres	Arable
480		Rick Yard	Arable
446	Early Verulam / George Webb	Lower Church Field	Arable
454		Ten Acres	Arable
459	Reverend Edward Craig/ John Lavender	Great Burrows Field	Arable
460		Lower Tarvice Down	Arable
461		Tarvice Dell	Wood
462		Upper Tarvice Down	Arable
463		Great Hill Field	Arable
464		Little Hill Field	Arable
465		Hill Field	Arable
466		Warren Orchard	Grass
467		Revel End	Homestead
468		Dark Orchard	Grass
469		Little Grove Field	Grass
470		Great Grove Field	Arable
473		Slipe	Grass
487		Lower Grove	Arable
488		Upper Grove	Arable
489		Crab Tree Field	Arable
490		Wending Shot	Grass
491		Rick Yard	Not Recorded
492		Rick Yard Meadow	Grass
493		Great Orchard	Grass
494		Orchard	Grass
495		Homestead	Not Recorded
496		Lawn	Grass
497		Long Croft	Arable
498		Middle Field	Arable
499		Further Field	Arable
512		Swallow Field	Arable
503	John Hotchkiss/John Catlin	Six Acres	Arable
504		Revel End Field	Arable
505	Reverend Edward Craig/John Lavender	Home Common	Arable
506		Armans Field	Arable
507		Armans Orchard	Grass
508		Wood	Wood
509		Spring	Wood

510		Stocking	Arable
511		Dell	Wood
512		Swallow Field	Arable
513		Saint Mary's Butts	Arable
514		Dell Field	Arable

5.32 The 1883 – 1884 OS map (Figure 13) shows a degree of field amalgamation within the Site, with several field boundaries removed. The mapping shows planted boundaries to the fields, indicating the presence of hedgerows or treelines. In addition, a probable quarry pit is shown within the central, north part of the Site, just southwest of Great Revel End Farm (recorded on the mapping as 'Great Revelend Farm'). A number of other quarry pits are also depicted, which were shown on the tithe map, and correspond with geophysical anomalies. The farmstead within the Site, formerly associated with Great Revel End Farm, has since been demolished. Footpaths are depicted on the mapping, linking nearby farms and fields. Southeast of the Hemel Hempstead Road, the Midlands Railway Hemel Hempstead Branch Line had been constructed, paralleling the road between Hemel Hempstead and Redbourn.

5.33 Outside of field reorganisation, boundary removal and quarry pit infilling, there was little change within the Site during the 20th and early 21st century (Figures 14 - 16).

5.34 The Site contains a high potential for a structure in the south-western area of the site (which likely dates to the Post Medieval period), sub-surface remains of the farmstead associated with Great Revel End Farm and negligible/low potential for significant Post Medieval/Modern remains of all other periods.

5.35 Elements of the site's perimeter and c. 6 lengths of the hedging within the site, are illustrated on the 1771 and 1841 maps of the Site. Under the criteria set out in the Hedgerow Regulations 1997, an 'important' hedgerow is a substantial, complete hedgerow which is recorded in a document held at a Record Office as an integral part of a field system pre-dating the Inclosure Acts. Therefore, according to the Hedgerow Regulations criteria, these hedgerows (Figure 17) can be classified as 'important' under the Hedgerow Regulations 1997.

Assessment of Significance (Designated Assets)

5.36 Existing national policy guidance for archaeology (the NPPF as referenced in section 2) enshrines the concept of the 'significance' of heritage assets. Significance as defined in the NPPF centres on the value of an archaeological or historic asset for its 'heritage interest' to this or future generations.

5.37 The Site is located c.200m to the west of The Aubreys Camp Scheduled Monument (List Entry 1003520), a defended enclosure almost certainly of Iron Age date. The enclosure's designation as a national important monument is derived foremost from its aesthetic and archaeological interest – it constitutes earthwork remains and surviving below ground evidence for what is likely to be have been a communal meeting point in the middle to later Iron Age – perhaps with continued and potentially changing use in the Roman and later periods.

5.38 Evidence suggests that the camp, which is situated at a relative low point within the surrounding landscape (as illustrated by the LiDAR – Figure 8), would have acted as a meeting point rather than a defensive location. The enclosure's setting, which is tightly defined owing to screening vegetation, built-form and topography, has changed considerably since its construction and is predominantly late 20th-century in character. The monument itself is now densely vegetated, its interior developed as part of the Aubrey Park Hotel, and it is bounded to the east by the M1, to the west by late 20th to 21st-century housing, and to the north by Gaddensden Lane and a large agricultural field – which in turn is bounded by mature planting. The current setting of the

Monument therefore makes little or no contribution towards its significance – being dominated by Modern intrusions.

5.39 Archaeological trenching (307 trenches) to the south across 320 ha, suggests that the wider landscape was sparsely populated in the Iron Age and Roman periods. There is no evidence for Late Iron Age/Early Roman settlement identified within c.500m of the Scheduled Monument and only limited settlement evidence c.600 – 700m to the south-east and c.3km to the south.

5.40 Trial trenching within the Site at Great Revel End Farm, identified a gravelled surface with elements of burnt stone and six sherds of Iron Age pottery.

5.41 The results of the trial trenching within the wider landscape and at Great Revel End Farm, indicates the landscape was only sparsely occupied during the Iron Age and Roman periods and there is currently only limited evidence to suggest the Site itself is likely to contain evidence for Iron Age settlement, which is focused at Great Revel End Farm, outside of the area that is proposed for residential development.

5.42 The Site is assessed to make no contribution to the setting or significance of the Scheduled Monument. There is no intervisibility between the Site and the Scheduled Monument, other than the more recent planting which mark it in the landscape. The current landscape character is dominated by 20th century enclosure, and therefore, does not contribute to the enclosure's significance.

Assessment of Significance (Non-Designated Assets)

5.43 The Site contains a moderate to high potential for Late Bronze Age/Early Iron Age remains, in the form of unenclosed settlement activity and isolated features such as post holes and pits at Great Revel End Farm and in the vicinity of the dry valleys. There is also potential for isolated Neolithic pits to be located within the Site. If any such remains are on Site, they are of archaeological interest and evidential value, and likely to be of local to regional importance. These remains have the potential to inform relevant research agendas in the East of England Research Framework, such as 'LBA-MIA 07: What can we infer about the relationship between open and enclosed settlements?'. If Iron Age settlement remains do survive at Great Revel End Farm, these have the potential to increase our understanding of the local Iron Age landscape, and possibly inform our understanding of the immediate context of The Aubreys Camp.

5.44 Previously identified earthworks of Medieval ridge and furrow, boundary ditches and possible house platforms (6373) are recorded north-east of Great Revel End. Geophysical anomalies identified in this area are likely to represent enclosures/building platforms. This area originally lay outside of the site boundary at the time of the site visit. Therefore, it is uncertain if earthworks currently survive on Site. Medieval settlement remains are of archaeological interest, evidential value and local importance. These remains have the potential to inform relevant research agendas in the research framework, such as 'Med (Rural) 09: How can we characterise medieval rural settlement morphology and relationships?'.

5.45 Remains of a probable structure were identified by the geophysical survey within the south-western area of the site, adjacent to Holtsmere End Lane. This structure is not illustrated on any of the mapping available to this report but based on the possibility that the magnetic response is associated with brick rubble, it likely dates to the Post Medieval period. Given the origins and function of this probable structure are unknown, surviving sub-surface remains are of archaeological interest, evidential value and local importance.

5.46 The historic field boundaries within the south-western area of the Site, which survive as cropmarks, are recorded on the HER (16962). These appear to be positioned on earlier Medieval headlands. Ploughed out remains of field boundaries, and earlier headlands, are of no archaeological interest,

5.47 A farmstead was located within the northern area of the Site, just to the south of Great Revel End Farm. This farmstead is of at least a 19th century date, being depicted on the 1806 OS and the 1841 tithe map, but is more likely to date to at least the late Post Medieval, similar to Great Revel End Farm. Given its clear association with the Listed Great Revel End Farm, remains of the farmstead are of archaeological interest and evidential value, particularly since surviving structural remains may give an indication of the construction date of the farmstead. These remains are of local importance and have the potential contribute to the significance of Great Revel End Farm.

5.48 The Site contains a low potential for remains of all other periods.

6 THE PROPOSED DEVELOPMENT & REVIEW OF POTENTIAL DEVELOPMENT IMPACTS ON ARCHAEOLOGICAL ASSETS

Proposed Development

6.1 The majority of the western area of the site, falls within Policy H1, and is allocated for residential development.

6.2 The areas east of the allocated area, are proposed for SANG, or are to remained undeveloped. The final extent of the SANG area is to be determined.

Review of Potential Development Impacts on Designated Archaeological Assets

6.3 The Aubreys Camp enclosure is currently occupied by the modern Aubrey Park Hotel (which itself contains parts of the Post Medieval Foster's Farm). Dense planting is located atop the enclosures earthworks and are a later addition (i.e. not part of the original enclosure). Modern housing sat within dense vegetation and planting, is located between the enclosure and the Site. The M1 bounds the camp to the east, Gaddesden Lane to the north and Hemel Hempstead Road to the south. Consequently, the origins of the Aubreys Camp as an Iron Age enclosure is not obvious to those outside of the archaeological/heritage profession or local history groups, and it is currently not experienceable as an enclosure without the aid of prior knowledge or historic mapping.

6.4 The Site is largely enclosed, owing to mature vegetative screening afforded by the hedgerows and trees both within, bounding, and proximal to it. As a result, views into and out of the Site towards the Scheduled Monument are either non-existent or limited, though with a degree of seasonal variation.

6.5 The residential development is proposed within the western area of the Site, restricted to within the Policy H1 area, that is allocated for residential development. The area to the east of Policy H1, is proposed to be SANG or to remain undeveloped, and therefore, this will mean the retention of the current fields – albeit with potential additional planting and pedestrian pathways. The potential Iron Age settlement remains at Great Revel End Farm, are located within an area that is to remain undeveloped and will be preserved in situ.

6.6 Although the development within the Site will result in a change within the wider landscape setting of the Scheduled Monument, the perceivability of the proposed development would be mitigated by the retention of the fields east of the allocated area, as these will form part of the SANG or remain undeveloped. This will provide a buffer between the development and the monument.

6.7 Overall, this report considers the proposed development will have no impact to the significance of the Scheduled Monument. A meeting is scheduled in April 2025 with the planning archaeologist and Historic England to further assess the potential impacts on the Scheduled Monument. A Setting Assessment will be submitted to support the planning application and provide a robust assessment of the significance and impacts on The Aubreys Camp. The scope of this report will be discussed with Historic England and the planning archaeologist in a site meeting scheduled April 2025.

Review of Potential Development Impacts on Non-Designated Assets

6.8 Groundworks associated with the residential development focused within the western areas of the Site and within Policy H1, such as the excavation of foundation trenches, are expected to have a high impact on potential archaeological remains within the allocated area of the Site. The true extent of archaeological remains within the Site, will have to be confirmed by a programme of evaluation trenching, which can be secured by an appropriately worded planning condition.

6.9 Within the area proposed for SANG, there is an enhanced potential for Late Bronze Age/Early Iron Age activity, a high potential for Medieval settlement and a high potential for surviving sub-surface remains of the farmstead associated with Great Revel End Farm. However, groundworks involved with the SANG, will have a lower impact on archaeological remains than the residential development. Design solutions can be incorporated (if necessary) to minimise impact in the areas of the SANG that contain archaeological interest, retaining any potential archaeological remains in-situ.

7 SUMMARY AND CONCLUSIONS

7.1 This Archaeological Desk Based Assessment has been prepared by RPS, for Pigeon (Hemel Hempstead) Limited & Bloor Homes, for c.152.41 ha of land located north of Hemel Hempstead Road, Hemel Hempstead, Hertfordshire (centred at National Grid Reference TL 084 106).

7.2 This desk-based assessment updates the report submitted to the planning archaeologist and Historic England on 20th March 2025 in response to a change in the application boundary from 112ha to 152.41ha and further to receipt of initial comments on the submitted documents. The application area allows for a sizeable area of Suitable Alternative Natural Greenspace (SANG). Figure 1 shows the extent of the Site's allocation (shaded blue), which is the focus for any built development, and includes a significant green buffer/corridor along its eastern edge. The western area of the Site is proposed for allocation for residential development as part of one of the North and East Hemel Hempstead Growth Areas, within the Hemel Garden Communities (HGC) Delivery Statement (site reference H1). This forms part of a wider area of allocation to the east, north-east and north of Hemel Hempstead.

7.3 This document has been prepared in compliance with the National Planning Policy Framework, local planning requirements and relevant guidance documents. A separate Built Heritage Statement has been prepared to assess any impact upon built heritage assets within the vicinity of the Site (RPS 2025).

7.4 There are no designated heritage assets located within the Site. One Scheduled Monument, Aubreys Camp a defensive enclosure likely dating to the Iron Age, is located c.200m to the east, below the Site in the bottom of a valley. There is no clear intervisibility between the Site and the Scheduled Monument, which is surrounded by dense planting. The valley location of the Monument evidences the fact that the Site has not historically made a positive contribution to the Monument's significance, a fact reinforced by the lack of any obviously Iron Age/Roman settlement remains identified on the geophysical survey undertaken across the Site. Though Iron Age features were previously identified at Great Revel End farm, these are located within the proposed SANG, and are therefore unlikely to be impacted by the proposed development.

7.5 The proposed development, which allows for a green buffer at the western extent of the Site, will have no direct or indirect impacts upon the Scheduled Monument or its setting and significance. A meeting is scheduled in April 2025 with the planning archaeologist and Historic England to talk through initial comments made by both parties to the submitted heritage information. This is likely to lead to the production of a detailed Setting Assessment relating to the Scheduled Monument of Aubreys Camp.

7.6 The Site contains 12 HER entries. cropmarks (likely to be of Post Medieval or later dater), Great Revel End Farm itself and the remaining seven associated with surface finds. These are detailed below.

7.7 There are 12 HER entries within the Site. These relate to the Late Iron Age features at Great Revel End Farm, Medieval earthworks to the north of the farm associated with a deserted medieval village, cropmarks of field boundaries (likely to be post-Medieval or later in date), with the remainder consisting of surface finds dating from the Late Iron Age to Modern period (including a late Bronze Age socketed axe). Geophysical surveys of the Site (2019 and 2025) have identified very few anomalies of obvious archaeological interest relative to the size of the Site. These comprise possible Medieval to Post Medieval enclosures/housing platforms close to the deserted medieval village, probable Post Medieval structure within the south-western area, a number of short ditch lengths of unclear date; Post Medieval to Modern quarry pits and a set of World War II camp huts. The geophysical survey was carried out prior to the extension of the red line boundary, and therefore, does not include the c.7.5 ha field in the south-eastern corner of the Site.

7.8 Fieldwork undertaken locally, in particular across a c. 320 ha application area to the south, has identified unenclosed Bronze Age and earlier Iron Age settlement, apparently favouring locations close to dry-valleys and some evidence for Romano-British field systems. The current application area is assessed to have an enhanced potential for remains of these periods – in particular around the dry valleys that cross the Site and also in the vicinity of Great Revel Farm – where a burnt surface has been previously recorded. Such remains are likely to be of local interest.

7.9 Elements of the Site's perimeter and c. 6 lengths of the hedging within the Site, qualify as 'important hedgerows' as per The Hedgerow Regulations 1997.

7.10 There are no obvious archaeological constraints to the Site's development and it is unlikely that the Site will contain any archaeological remains that will need to be preserved in-situ or to be designed around. The planning archaeologist will require a scheme of archaeological trial trenching to test the geophysical anomalies, verify the veracity of the geophysical survey and confirm the Site's archaeological potential. The trial trenching, and the need for any additional geophysical survey, will be discussed with the planning archaeologist and Historic England in a site meeting scheduled for April 2025.

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Cartographic

1768 A Survey of the estates of the Right Honourable James Lord Viscount Grimston situate in the several parishes of St Michaels, Redbourne, St Albans, St Peters and St Stephens Wheathamstead in the county of Hertford (Hertfordshire Archive Reference DE/V/P2)

771 Plan of land in Redbourn (Hertfordshire Archive Reference XIII/16)

1841 Tithe Map of Redbourn

1878 Ordnance Survey 1:2,500

1883 – 1884 Ordnance Survey 1:10,560

1898 Ordnance Survey 1:2,500

1899 Ordnance Survey 1:10,560

1924 Ordnance Survey 1:2,500

1925 – 1926 Ordnance Survey 1:10,560

1938 Ordnance Survey 1:10,560

1947 – 1950 Ordnance Survey 1:10,560

1960 Ordnance Survey 1:10,000

1964 – 1965 Ordnance Survey 1:10,000

1976 Ordnance Survey 1:2,500

1981 – 1982 Ordnance Survey 1:10,000

1983 Ordnance Survey 1:2,500

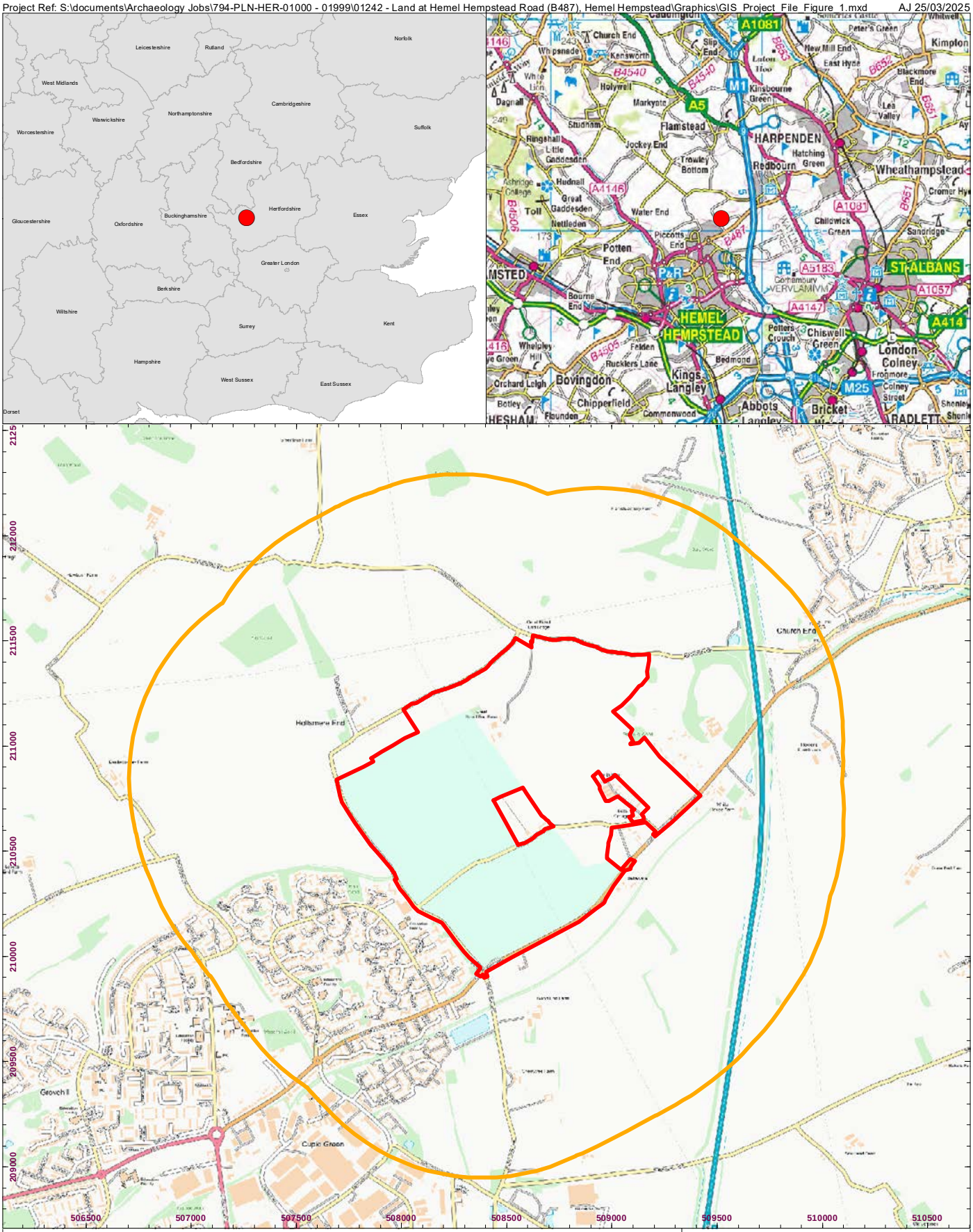
1993 Ordnance Survey 1:2,500

1999 Ordnance Survey 1:10,000

2006 Ordnance Survey 1:10,000

2024 Ordnance Survey 1:10,000

FIGURES



1km Search Area

Policy H1 Land

N

0 300 600 m

Scale at A4: 1:25,000

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Figure 1

Site Location

AJ 26/03/2025

Site Boundary

1km Search Area

Listed Buildings (Grade)

I

II

II*

Scheduled Monuments

Redbourn Conservation Area

1003520

N

0 150 300m

Scale at A3: 1:13,000

rps
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Figure 2

Designated Heritage Assets

Project Ref: S:\documents\Archaeology Jobs\794-PLN-HER-01000 - 01999\01242 - Land at Hemel Hempstead Road (B487), Hemel Hempstead\Graphics\GIS_Project_File_A3L.mxd

AJ 25/03/2025

Site Boundary

Great Revel End Lodge

GADDESDEN LANE

HOLTSMERE FARM LANE

Holtsmere End

Possible Ditch

Quarrying Pits

Quarrying Pits

Ditches?

Possible Enclosures/Building Platforms

Linear Anomalies

Linear Anomalies

Linear Anomalies

Quarrying Pits

Dry Valley

Linear Anomalies

Quarrying Pits

Linear Anomalies

Quarrying Pits

Quarrying Pits

World War II Huts

White House Farm

HEMEL HEMPSTEAD ROAD

B487

Quarrying Pits

Dry Valley

Building

Belvedere

Education Facility

N

0 150 300m

Scale at A3: 1:6,500

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Figure 3

Geophysical Surveys

Project Ref: S:\documents\Archaeology Jobs\794-PLN-HER-01000 - 01999\01242 - Land at Hemel Hempstead Road (B487), Hemel Hempstead\Graphics\GIS_Project_File_A3L.mxd

AJ 25/03/2025

Site Boundary

Neolithic

Early-Middle Bronze Age

Late Bronze Age/Early Iron Age

Late Iron Age

Early Roman

N

0 250 500m

Scale at A3: 1:18,000

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Figure 4

Geophysical Survey and Areas of Archaeology Identified by the Trenching to the South

Project Ref: S:\documents\Archaeology Jobs\794-PLN-HER-01000 - 01999\01242 - Land at Hemel Hempstead Road (B487), Hemel Hempstead\Graphics\GIS Project File A3L.mxd

AJ 26/03/2025

Site Boundary
1km Search Area
Monuments (points)
Monuments (lines)
Monuments (polygons)

MHT33322
MHT33308
MHT33652
6373
12656
31428
12657
12658
MHT36052
MHT38866
15130
MHT36003
MHT33255
MHT32827
13091
18758
MHT32831
21482
21483
16962
9809
MHT39282
9809
9664

Long Wood
New Wood
Flamsteadbury Farm
Bury Wood
Hawbush Farm
Hay Wood
Great Revel End Lodge
Church End
Holtsmere End
Great Revel End Farm
Pancake Wood
Flower's Farmhouse
Eastbrookbay Farm
North Barn
White House Farm
Betts Cottage
Belvedere
High Wood
Education Facility
Woodhall Wood
Wood End Farm
Cherrytree Farm
The Kop
Southend Farm
Grovehill
Cupid Green

N
0 150 300m
Scale at A3: 1:13,000

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Figure 5

HER Data - Monuments

Project Ref: S:\documents\Archaeology Jobs\794-PLN-HER-01000 - 01999\01242 - Land at Hemel Hempstead Road (B487), Hemel Hempstead\Graphics\GIS_Project_File_A3L.mxd

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EHT3024
Great Revel
EHT3025
EHT3900
EHT3022
EHT3020
EHT3021
EHT3023
Great Revel End Farm
EHT3016
EHT1709
EHT2239
EHT3017
EHT3018
EHT3015
EHT3013
EHT3014
EHT8326
EHT9103
EHT8294
Holtsmere End
Church End
Flamsteadbury Farm
Bury Wood
Hawbush Farm
Hay Wood
Eastbrookbay Farm
Pancake Wood
Flower's Farmhouse
White House Farm
Betts Cottage
Belvedere
Woodfens Farm
Chantlow Farm
The Kop
Southend Farm
Grovehill
Cupid Green
Woodhall Wood
High Wood
Education Facility
PW
PO

Site Boundary
1km Search Area
Events (points)
Events (polygons)

N
0 250 500 m
Scale at A3: 1:13,000

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Figure 6

HER Data - Events

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Site Boundary

1km Search Area

18th - 20th Century Woodland Plantation

20th Century Enclosure

Boundary Loss

Built-Up Areas - Urban Development

Coaxial Enclosure

Historic Earthwork

Irregular Enclosure

HHT6390
HHT6387
HHT6391
HHT6391
HHT6352
HHT6335
HHT3237
HHT3237
HHT6336
HHT6334
HHT6330
HHT6335
HHT6334
HHT6337
HHT6338
HHT6337
HHT6342
HHT6338
HHT6342
HHT6341
HHT6341

Holtsmere End
Church End
Flamsteadbury Farm
Bury Wood
Great Revel End Lodge
Hay Wood
Hawbush Farm
Eastbrookbury Farm
Flower's Farmhouse
Belvedere
Woodend Farm
Cherrytree Farm
The Kop
Southend Farm
Grovehill
Cupid Green
Education Facility

N

0 150 300m

Scale at A3: 1:13,000

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Figure 7

Historic Landscape Character

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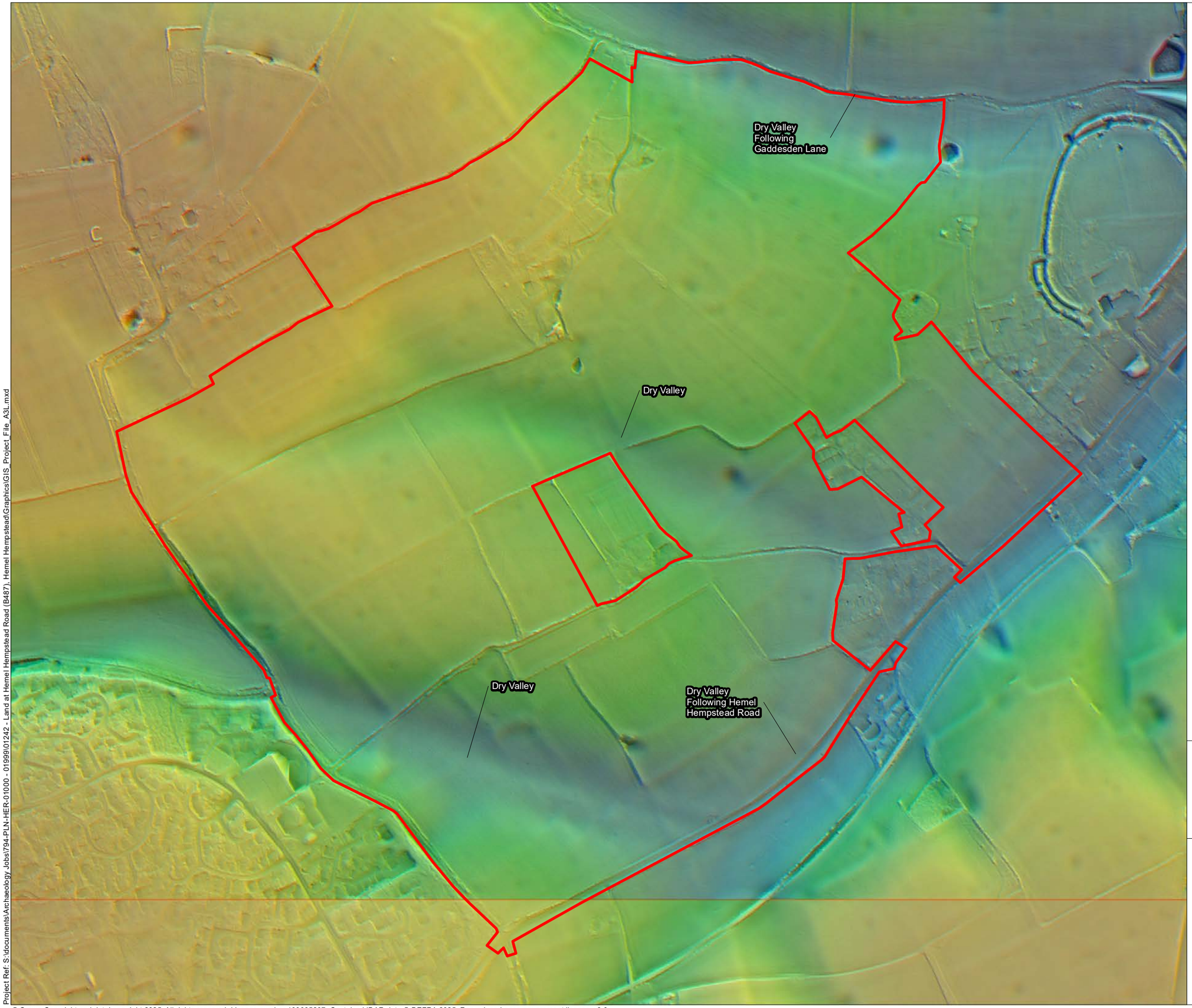

Site Boundary

Digital Terrain Model
Multi-hillshade Processing & Simple Local Relief Model
@1m Resolution
Data Capture: 2020 - 2021

Red - High Areas
Blue - Low Areas

N

0 150 300m

Scale at A3: 1:6,500

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Figure 8

LiDAR Data

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Site Boundary

N

0 50 100m

Scale at A3: 1:4,000

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Figure 9

1768 Survey of the Estate of Grimston

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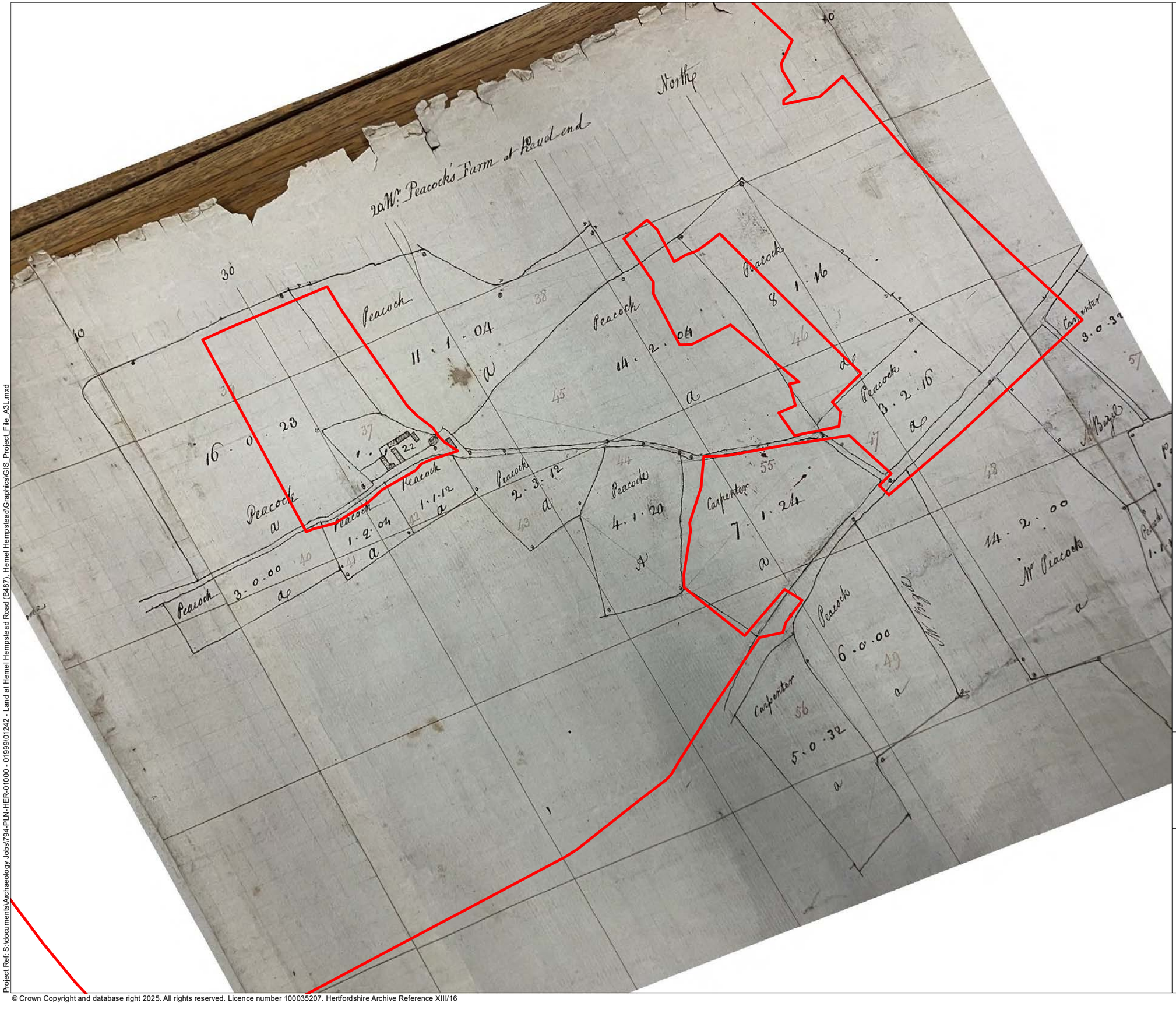

Site Boundary

N

0 50 100m

Scale at A3: 1:4,000

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Figure 10

1771 Plan of Land in Redbourn

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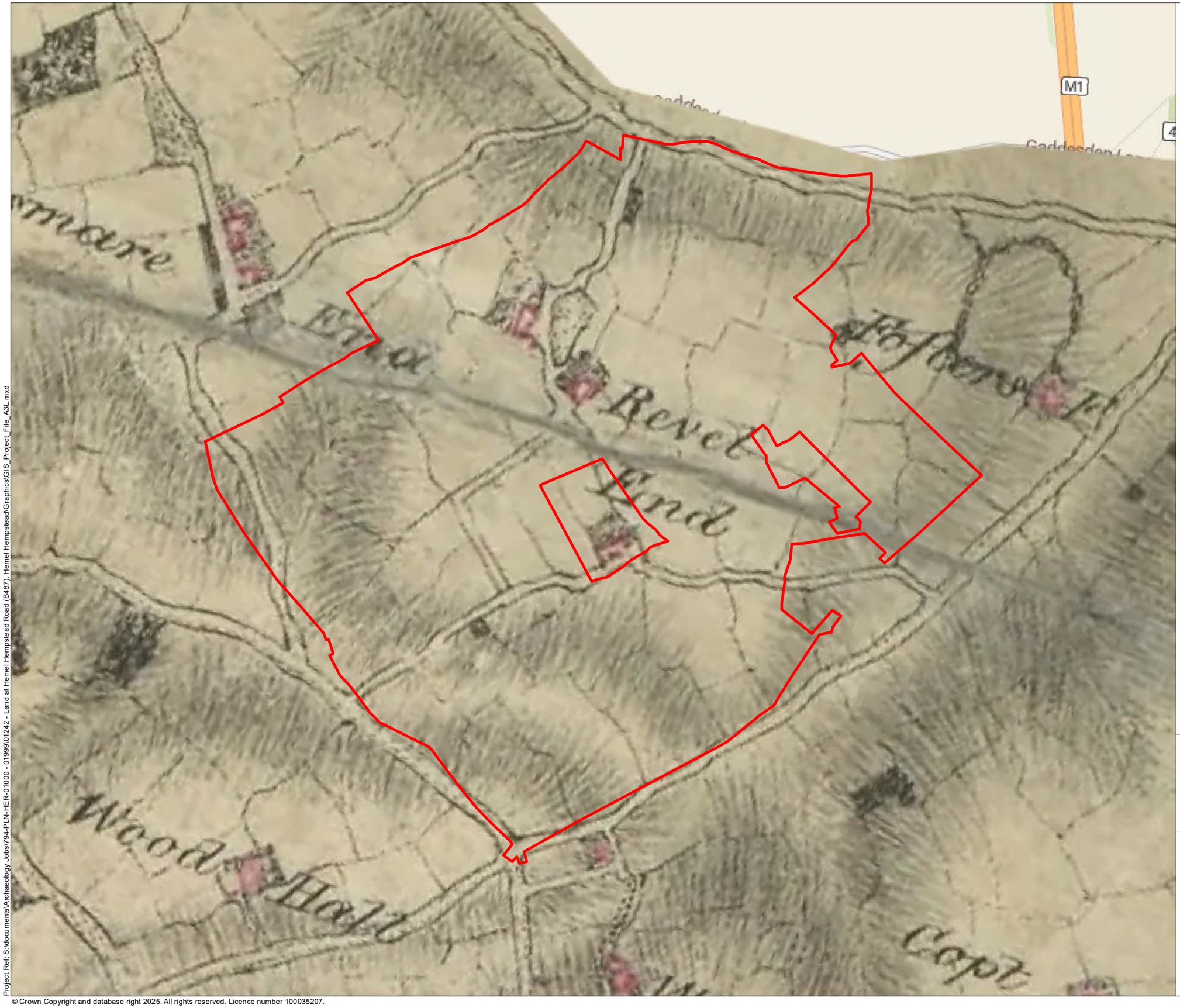
AJ 25/03/2025



Site Boundary

N

0 150 300 m

Scale at A3: 1:8,000

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Figure 11

1806 Ordnance Survey

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