HALLAM LAND MANAGEMENT LIMITED
ST ALBANS SCHOOL
ST ALBANS SCHOOL WOOLLAM TRUST

Woollam Park

Environmental Statement

February 2025

LRM PLANNING LIMITED

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Abbreviations

AAWT	Average Annual Weekday Traffic
AADT	Annual Average Daily Traffic
AAWT	Annual Average Weekly Traffic
ACEC	Aggressive Chemical Environment of Concrete
AGP	Artificial Grass Pitch
AOD	Above Ordnance Datum
AoS	Acoustic of Schools: A Design Guide
AQAL	Air Quality Assessment Level
ASL	Advanced cycle stop lines
ATC	Automated Traffic Counts
BB93	Building Bulletin 93
BGS	British Geological Survey
BL	British Library
BMV	Best and Most Versatile Agricultural Land
BNL	Basic Noise Level
BNG	Biodiversity net gain
BPM	Best Practicable Means
BRE	Building Research Establishment
BS	British Standard
CEMP	Construction Environmental Management Plan
CIFA	Chartered Institute for Archaeology
CRTN	Calculation of Road Traffic Noise
CTMP	Construction Traffic Management Plan
dB	Decibel
DCMS	Department Culture Media and Sport
DEFRA	Department of Environment, Farming and Rural Affairs
DfT	Department for Transport
DMRB	Design Manual for Roads and Bridges
ECOW	Ecological Clerk of Works
EFT	Emission Factor Toolkit
EIA	Environmental Impact Assessment
EMP	Ecological Management Plan
EPUK	Environment Protection UK
ESC	Environmental Sound Criteria
ES	Environmental Statement
FBS	Future Building Standard
FCS	Favourable Conservation Status
FHS	Future Homes Standard
GHG	Greenhouse Gas
GWP	Global Warming Potential
GVZ	Groundwater Vulnerability Zone
HALS	Hertfordshire Archives and Local Studies
HCC	Hertfordshire County Council
HDV	Heavy Duty Vehicle
HHRC	Hertfordshire Historic Environment Record
HERC	Hertfordshire Ecological Records Centre
HGV	Heavy Goods Vehicle
HEDBA	Historic Environment Desk Based Assessment
HE	Historic England
IEF	Important Ecological Features
IEMA	Institute of Environmental Management and Assessment
IAQM	Institute of Air Quality Management
IPCC	International Panel on Climate Change
JAQU	Joint Air Quality Unity
LOAEL	Lowest Observed Adverse Effect Level
LCA	Landscape Character Area
LDC	Land Drainage Consent
LDV	Light Duty Vehicle
LEA	Local Education Authority
LEAP	Local Equipped Area of Play
LLFA	Local Lead Flood Authority
LPA	Local Planning Authority
LWS	Local Wildlife Site
MCC	Manual Classified Count
ML	Monitoring Location
NCA	National Character Area
NCL	Noise Consultants Ltd
NA	National Archives
NERC	Natural Environmental and Rural Communities

NH	National Highways
NHLE	National Heritage List for England
NPPF	National Planning Policy Framework
NPSE	Noise Policy Statement for England
NSR	Noise Sensitive Receptor
NTEM	National Trip End Model
OASA	Old Albanians Sports Association
PIC	Personal Injury Collision
PPG-N	Planning Practice Guidance – Noise
PPV	Peak Particle Velocity
ProPG	Professional Practice Guidance on Planning and Noise: New Residential Development
RIBA	Royal Institute of British Architects
ROFSW	Risk of Flooding from Surface Water
RPA	Route Protection Area
SA	Sustainability Appraisal
SAC	Special Area Conservation
SACDC	St Albans City & District Council
SOAEL	Significant Observed Adverse Effect Level
SM	Scheduled Monument
SSSI	Site of Specialist Scientific Interest
SuDS	Sustainable Drainage System
TNA	The National Archive
UAEL	Unacceptable Adverse Effect Level
UXO	Unexploded Ordinance
VML	Vibration Monitoring Location
WFD	Water Framework Directive
WLCA	Whole Life Carbon Assessment
WHO	World Health Organization
WHS	World Heritage Site
WRc	Water Resource Centre
ZTV	Zone Theoretical Visibility

DOCUMENT CONTROL

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1 Introduction

1.1 Hallam Land Management Limited, and St Albans School and St Albans School Woollam Trust ("the applicants") have submitted a planning application for a mixed used development on land at North St Albans.

1.2 The Applicants have undertaken an Environmental Impact Assessment ("EIA") and have prepared this Environmental Statement ("ES") to accompany the planning application, in accordance with the Town and Country Planning (Environmental Impact Assessment) Regulations 2017.

THE APPLICATION SITE

1.3 The application site measures some 50.30 hectares in size. It primarily comprises arable land in agricultural use. An area of three hectares adjoining Harpenden Road is currently used as playing fields which are to be relocated and replaced.

1.4 The site is situated to the north of Longspring Wood, west of the mainline railway, and astride Sandridgebury Lane. Land to the west of the site, referred to as "Sewell Park", benefits from outline planning permission for new housing. Woollam Playing Fields are to the north east of the site.

THE PROPOSED DEVELOPMENT

1.5 Planning permission is sought for the following proposed development:

(1) *Relocation and replacement of existing playing fields and erection of pavilion annex; and*

(2) *Construction of up to 1000 new homes (Use Class C3) to include a mix of market housing, affordable housing, age restricted specialist accommodation for the elderly, adult disability service units; a care home (Use Class C2); a local centre (Use Classes E and F); a primary school (Use Class F); the laying out of green infrastructure including habitat creation; drainage infrastructure; earthworks; pedestrian and cycle routes; new means of access and alterations to existing accesses.*

1.6 The submission comprises a "hybrid" planning application, whereby the majority of the application is submitted in "outline" with all matters reserved for future consideration, and the remaining elements are submitted in "full" detail. The form of the planning application is explained in the Scheme Specification and Parameters Document submitted as part of the planning application.

REQUIREMENTS OF THE EIA PROCESS

European Union Directive 2011/92/EU (as amended by 2014/52/EU)

1.7 Environmental Impact Assessment is a procedure required under the EU Directives to assess the effects of certain public and private projects on the environment. Article 2 requires, "*before development consent is given, projects likely to have significant effects on the environment by virtue, inter alia, of their nature, size or location are made subject to a requirement for development consent and an assessment with regard to their effects on the environment.* Article 8 states that such an assessment is to be duly taken into account in the development consent procedure.

1.8 Following the UK departure from the European Union, the EIA Regulations have been transposed to UK law.

Town and Country Planning (Environmental Impact Assessment) Regulations 2017

1.9 The Town and Country Planning Act 1990 ("the Act") requires that a person wishing to develop land or change its use seeks planning permission from a Local Planning Authority ("the LPA").

1.10 Certain types of development are categorised as Environmental Impact Assessment Development because of its nature, size or location as defined by the Town and Country Planning (Environmental Impact Assessment) Regulations 2017 ("the Regulations"). In such instances, an applicant is required to undertake an Environmental Impact Assessment.

1.11 EIA is the process of assessing the environmental impacts of a development project. The Planning Practice Guidance describes EIA as follows:

"The aim of is to protect the environment by ensuring that when a LPA is deciding whether to grant planning permission for a project which is likely to have significant environmental effects on the environment, it does so in the full knowledge of the likely significant effects, and takes this into account in the decision making process.

"The aim of Environmental Impact Assessment is also to ensure that the public are given early and effective opportunities to participate in the decision-making procedures."

(Paragraph: 002 Reference ID: 4-002-20140306)

1.12 Planning applications for EIA Development must be accompanied by an Environmental Statement. The ES is the document reporting the EIA and must be provided to the LPA as part of its consenting process.

SCREENING SCOPING

1.13 The proposed developments described at paragraph 1.5 falls within category 10(b) (Infrastructure Projects: Urban Development) of projects listed in Schedule 2 of the EIA Regulations. Accordingly, the Applicants submitted a Screening Request and Scoping Report in 2019, to which St Albans District Council (the "District Council") issued their Scoping Opinion in response later that year. The EIA Scoping Opinion identified the need to consider the potential effects on a range of environmental, economic and social factors.

1.14 Given the passage of time, the Applicants re-submitted a Scoping Report in 2024 to re-establish the LPA's expectations of the Environmental Impact Assessment. This is included at Appendix 1.1. The LPA's Scoping Opinion as at Appendix 1.2. This confirmed the topics to be "scoped in", which include ecology and biodiversity; landscape and visual; agriculture and soils; heritage and archaeology; ground conditions; water resources; socio-economics; waste and material assets; climate change; traffic and movement; noise and vibration; air quality and cumulative effects.

STRUCUTURE OF THE ENVIRONMENTAL STATEMENT

1.15 The structure of the ES is shown at Table 1.

Table 1: Structure of the Environmental Statement

CHAPTERS	TITLE	CONTENT
1	Introduction	This chapter provides summary information about the projects and the environmental impact assessment process.
2	The application site	This chapter provides a description of the application site and should be read in conjunction with the various baseline assessments.
3	The proposed development	This chapter provides a description of the proposed development and is the basis for the assessment of effects.
4	Methodology	This chapter describes the broad methodology used in undertaking the environmental impact assessment and presenting the conclusions in the environmental statement.
5	Alternatives	This chapter identifies the alternative options to delivering the proposed development that have been considered.
6	Ecology and biodiversity	This chapter considers the likely significant effects of the proposed development on important ecological features and biodiversity.
7	Landscape and visual	This chapter considers the likely significant effects of the proposed development on landscape attributes and visual receptors.
8	Agriculture and soils	This chapter considers the likely significant effects of the proposed development on agricultural land and the soils as a resource.
9	Heritage and archaeology	The chapter considers the likely significant effects of the proposed development on designated and non-designated heritage assets.
10	Ground conditions	The chapter considers the likely significant effects of the proposed development both in terms of present ground conditions and the risk to future occupants of the development of ground contamination.
11	Water resources	The chapter considers the likely significant effects of the proposed development on various aspects of the water environment.
12	Socio-economics	The chapter considers the likely significant effects of the proposed development on human beings, referred to as socio-economic effects.
13	Waste and material assets	This chapter considers the likely significant effects of the proposed development in terms of waste generation.
14	Climate change	This chapter considers the likely significant effects of the proposed development in terms of greenhouse gas emissions and resilience to climate change.
15	Traffic and movement	This chapter considers the likely significant effects of the proposed development as a result of changes traffic and movement.
16	Noise and vibrations	This chapter considers the likely significant effects of the proposed development on the noise environment and vibrations.

CHAPTERS	TITLE	CONTENT
17	Air quality	This chapter considers the likely significant effects of the proposed development in terms of changes to air quality.
18	Cumulative effects	This chapter considers the effects on environmental resources or receptors experienced as a combination of impacts.
19	Summary and conclusions	This chapter provides the overall conclusion as to the environmental effects of the proposed development.

THE EIA TEAM

1.16 The EIA process and the ES have been prepared by a team of specialists listed in Table 2.

Table 2: The EIA team

INPUT	ORGANISATION	COMPETENCE
EIA co-ordination	LRM Planning	Chartered members of the Royal Town Planning Institute and Practitioner Membership of the Institute of Environmental Management and Assessment
Ecology and biodiversity	FPCR	Chartered members of the Institute of Ecology and Environmental Management
Landscape and visual	Define	Chartered members of the Landscape Institute
Agriculture and Soils	Reading Agriculture	Practitioner Member Institute of Environmental Management and Assessment, Fellow British Institute of Agricultural Consultants and Member Institute of Soil Science
Heritage and archaeology	Orion Heritage	Chartered members of the Institute of Archaeologists
Ground conditions	Brookbanks	Members of the Institution of Environmental Sciences
Water resources	PJA	Member of the Institution of Civil Engineers
Socio-economics	LRM Planning	Chartered members of the Royal Town Planning Institute
Waste and material assets	Brookbanks	Chartered Member of the Institution of Building Services Engineers and Chartered Member of the Institute of Physics
Climate change	Turley	Practitioners of Institute of Environmental Management and Assessment.
Traffic and movement	PJA	Chartered members of the Institute of Highways and Transportation
Noise and vibrations	Noise Consultants	Members or Corporate Members of the Institute of Acoustics
Air quality	Air Quality Consultants	Chartered Scientist and Members of the Institute of Air Quality Management

1.17 The ES is comprised of the following:

Volume 1	Non-technical summary (“NTS”)
Volume 2	Main text
Volume 3	Technical appendices
Volume 4	Figures

1.18 The ES is available to purchase from LRM Planning Limited, 22 Cathedral Road, Cardiff, CF11 9LJ, for a cost of £150. A version can be provided on USB for a cost of £5. The Non-Technical Summary is available free of charge.

1.19 Comments on the ES should be sent to: St Albans City and District Council, Civic Centre, St Peter’s Street, St Albans, AL1 3JE.

2 The application site

2.1 This chapter provides a description of the application site. It sets out the locational site context, the site characteristics and its accessibility. A context plan is included at Appendix 2.1.

THE SITE

2.2 The site, shown at Appendix 2.2, measuring some circa 50.30 hectares, predominantly comprises arable land in agricultural use. It is sub-divided into five fields of varying size, all of which are irregular in shape. Specifically, the site is made up of four agricultural land parcels which are defined by hedgerows and tree belts, as well as three playing pitches measuring circa 3 hectares which form part of the existing Woollam Playing Fields and are leased to the Old Albanian Sport Association ("OASA") on a 250-year contract.

2.3 Sandridgebury Lane bisects the site, extending from the south western corner towards the north eastern portion of the site and to Harpenden Road. Valley Road connects Sandridgebury Lane with the wider St Albans area to the south, extending into a small area of the southern part of the site.

2.4 Longspring Wood extends from Valley Road along the southern boundary of the site. It is an area of ancient woodland and is identified as a Local Wildlife Site. A public right of way (Route 096) extends from Valley Road, through the wood, before extending north through the site towards Sandridgebury Lane.

LOCATION

2.5 The site is contained by the A1081 (Harpenden Road) to the west, the Midland Main Line railway line to the east, and Longspring Wood and Sandridgebury Lane to the south. It is surrounded by a mix of land uses, typical of its edge of settlement location. More specifically, it is bounded:

(1) to the north by additional pitches associated with Woollam Playing Fields, and agricultural land.

(2) to the east by the Midland Main Line railway line, beyond which lies open countryside.

(3) to the south east by Valley Road Industrial Estate, with the wider St Albans settlement beyond.

(4) to the south west by St Albans Girls' School and a recently constructed Artificial Grass Pitch (AGP), and residential land uses beyond.

(5) to the west by dwellings of Harpenden Road, and a 4 hectare parcel of land referred to as Sewell Park that benefits from outline planning permission for 150 dwellings and associated works (Ref: 5/2021/0423).

SITE CHARACTERISTICS

Heritage

2.6 The site does not contain, nor do its boundaries comprise, any listed building or designated heritage asset.

2.7 Two scheduled monuments are located within the vicinity. In closest proximity, a scheduled monument exists approximately 500m south of the site; this comprises an Iron Age territorial boundary known as Beech Bottom Dyke. It is visually and physically separated from the site by Longspring Wood, Valley Road Industrial Estate, and residential uses.

2.8 A single Grade II* and a number of Grade II listed buildings exist within a 2km radius of the site, however the site does not contribute to the setting of any of these assets. Two listed buildings are located approximately 800m north west of the site. These comprise Childwick Lodge and the associated entrance gates, railings and piers, both of which are Grade II listed. These features are also disconnected from the site, both physically and visually, by the existing tree belt which follows Harpenden Road, and the wider agricultural land.

Ecology

2.9 The site comprises four arable field parcels under agricultural cultivation and one amenity grassland parcel which is currently utilised for sports pitches. All field parcels are bounded by hedgerows, with the exception of the south-eastern boundary which is bounded by Longspring Wood, and the eastern boundary which comprises the railway line.

2.10 The site comprises habitats suitable for badgers, bats, reptiles, dormouse, breeding birds and wintering birds. A comprehensive suite of protected species surveys has been conducted.

2.11 The Chiltern Beechwood Special Area of Conservation ("SAC"), at its closest point, is approximately 14.5km to the west; the site therefore falls beyond the *zone of influence* for this designation.

2.12 There are nine non-statutory sites within 1km of the site. The nearest is Longspring Wood Local Wildlife Site ("LWS") located along the southern boundary of the site.

2.13 The surrounding landscape is largely dominated by urban environs to the south. To the north the landscape is comprised of arable land interspersed with semi-natural habitats including woodlands, semi-improved grasslands and hedgerows. Notably to the north-east of the application site is the Langley Wood LWS, comprised of a large woodland habitat complex of which parts are ancient woodland.

Landscape features

2.14 The site comprises a series of gently undulating arable fields, broadly sloping from west to east and separated by Sandridgebury Lane. These form part of a network of dry valleys, east of the A1081, spanning between Harpenden and Wheathampstead to the north and Sandridge and St. Albans to the east and south. Field boundaries throughout the site are typically intact and well managed and a parcel of ancient woodland extends along its southern boundary.

2.15 The site is enclosed by landform and vegetation to its north and south, and bounded by development land and the A1081 to its west and the Mainline Railway to its east. A public footpath extends southward from Sandridgebury Lane along the eastern boundary of the site and within the ancient woodland along the southern boundary. A permissive path also aligns within the site on the northern edge of the ancient woodland.

2.16 Views across the site are clear, owing to the folding topography, but are limited to some boundaries by neighbouring landscape and vegetation. To the west, planting associated with residential properties aligning with Harpenden Road restrict views into and out of the site, as does structural planting defining the sports fields to the north west. The belt of ancient woodland to the south screens the commercial and industrial uses beyond, and St Albans Girls' School limits views to the south west.

2.17 Mid distance and distant views are possible from within the site to open countryside to the north and east, above and beyond field boundaries and the embankment of the rail line which bounds the east of the site. Isolated properties are visible at distance.

Flood risk

2.18 The site generally falls from north west to south east, towards a localised depression adjacent to the railway embankment. The highest elevation within the site is approximately 122mAOD and is situated to the north east of the site, with the lowest elevation being approximately 102.7mAOD, situated adjacent to the eastern boundary. The site is underlain with a Bedrock geology of Kesgrave

Catchment Subgroup – Sand and Gravel, with two types of superficial deposits. To the north, centre and south of the development, areas of Lewes Nodular Chalk Formation and Seaford Chalk Formation (Undifferentiated) – Chalk are situated and to the north and west of the site, a superficial geology of Clay with Flints Formation – Clay, Silt, Sand and Gravel.

2.19 The publicly available Flood Map for Planning identifies the site entirely within Flood Zone 1, which means the site is outside of the maximum flood extents of nearby Main Rivers in the 1 in 100 year and 1 in 1,000 year flood events.

2.20 From review of the Long Term Flood Risk Information, Flood Risk from Surface Water Mapping, the site is predominantly identified to be at very low risk of surface water flooding. Two overland flow routes are identified within this mapping, one flowing from north west to the east, identified to be at low to medium surface water flood risk and one flowing from south west to east, identified to be low to high surface water flood risk. This mapping identifies localised areas to the be at high risk of surface water flooding, most notably to the east within the localised depression adjacent to the railway embankment.

2.21 This mapping has been produced at a national scale to provide the first publicly available generation of surface water flood risk mapping. Although this incorporates local estimates of the sewer and infiltration loss, it does not allow for local geology or hydraulic constraints/improvements to the underlying Digital Terrain Model ("DTM"). This means that local geology like chalk and the associated infiltration capacity are likely to be underrepresented.

2.22 A 225mm diameter combined sewer bisects the site within the north western parcel before flowing south along Harpenden Road, with a further existing, public 300mm diameter surface water sewer situated in Harpenden Road. These are shown on the existing Thames Water asset mapping.

Ground conditions

Geology

2.23 In terms of geology, the site is shown to be underlain by chalk of the Lewes Nodular Chalk Formation and Seaford Chalk Formation (undifferentiated).

2.24 In regard to superficial deposits, the majority of the north of the site is shown to be overlain by clay, silt, sand and gravel of the Clay-with-flints Formation. The majority of the southern part of the site is overlain by the Kesgrave Catchment Subgroup, comprising of sand and gravel. The Kesgrave Catchment Subgroup is also identified as outcrops in the centre and northern portions of the site.

Mining

2.25 The site is not within an area affected by coal mining, but does fall within an area affected by mining instability with evidence of conclusive rock mining. It also falls within a Rare Non Coal Mining Area of Great Britain.

Hydrogeology

2.25.1 The underlying bedrock geology of the site is shown to form a Principal Aquifer across the site, and the superficial deposits of the Clay-with-flints Formation in the north of the site, are shown to form Unproductive Strata, with the outcrops of the Kesgrave Catchment Subgroup, forming Secondary A Aquifers. In terms of groundwater vulnerability, the site falls within an area of indicative medium risk.

Accessibility

2.26 Harpenden Road, to the west of the site, is a key road within the area. It is a single carriageway which connects the site with St Albans city centre, and serves bus route 321, a primary inter-settlement route which operates between Luton and Watford via St Albans and Harpenden.

2.27 The Local Cycling and Walking Infrastructure Plans ("LCWIP") also proposes that Harpenden Road will accommodate a series of walking and cycling routes, presenting further opportunities for the site to connect with New Greens (to the west), Sandridge (to the east), and the wider St Albans area.

2.28 The adjacent Sewell Park development also provides a series of connection links which present an opportunity to increase pedestrian permeability to and from the site.

2.29 Valley Road Industrial Estate, also known as Porters Wood Industrial Estate, is located to the immediate south of Longspring Wood. It predominantly provides a mix of industrial, employment and commercial uses, albeit a small portion of residential use is present at its north eastern corner.

2.30 The site benefits from good access to education provision. St Albans Girls' School is located to the south west, comprising of the school and associated sports infrastructure. This includes the recently constructed Artificial Grass Pitch ("AGP"), gymnastics club, tennis and netball courts, and sports hall. Sandringham School is also located within 3.5km of the site, accommodating Key Stages 3 and 4, and sixth form. Townsend Church of England School accommodates the same age groups. Three primary schools also exist within 3km of the site, including Margaret Wix Primary School, Batchwood School, and Wheatfields Junior School.

2.31 A number of opportunities for recreation and leisure exist in proximity to the site. Public Right of Way route 096 extends through the site towards Sandridgebury Lane. A Public Right of Way also extends from New Greens to Sandridge, to the north of the site (St Michael Rural 001, 001a, Sandridge 009). Woollam Playing fields accommodate a number of local club activities, and more informal recreation grounds are accessible at New Greens. The Woodland Trust's Heartwood Forest is also located to the north east of Sandridge.

SEWELL PARK

2.32 Land adjacent to the site benefits from outline planning permission for 150 new dwellings and associated works as part of planning application 5/2021/0423 granted in January 2022. It measures approximately 4ha in size and is broadly rectangular in shape, comprising of land to the rear of existing dwellings on Harpenden Road.

2.33 As part of this planning permission, access to Sewell Park was approved via Harpenden Road. A number of pedestrian and cycle links between the site and Sewell Park were also indicated, presenting an opportunity for increased pedestrian permeability between the two sites.

2.34 A reserved matters application (Ref: 5/2024/1284) has now been submitted to the LPA pursuant to the outline permission. This was validated on 24th July 2024. The application seeks approval for the appearance, landscaping, layout and scale of 123 dwellings. The accommodation mix includes 40% affordable housing, and a mix of dwelling types. The layout also includes a children's play area, a community growing area, semi-natural green spaces, internal access arrangements designed around a street hierarchy, sustainable drainage systems, vehicular and cycle parking, and pedestrian and cycle connections to the northern and eastern boundaries. At the time of writing, this application has not been determined.

3 The proposed development

3.1 This chapter describes the proposed development for which planning permission is sought and which has been the basis of the EIA.

THE DEVELOPMENT FOR WHICH PLANNING PERMISSION IS SOUGHT

3.2 Planning permission is sought for the following proposed development:

(1) Relocation and replacement of existing playing fields and erection of pavilion annex; and

(2) Construction of up to 1000 new homes (Use Class C3) to include a mix of market housing, affordable housing, age restricted specialist accommodation for the elderly, adult disability service units; a care home (Use Class C2); a local centre (Use Classes E and F); a primary school (Use Class F); the laying out of green infrastructure including habitat creation; drainage infrastructure; earthworks; pedestrian and cycle routes; new means of access and alterations to existing accesses.

3.3 The form of the application is described in the accompanying **Scheme Specification and Parameters** document. The application is submitted as a "hybrid" application. Part (1) is submitted as a full application. Part (2) is submitted as an outline application with approval of means of access sought at the present time, and all other reserved matters to be approved at a later date.

Land use components

3.4 The proposed development comprises the following components:

(1) up to 1000 new homes (C3) of which 40% shall be affordable housing and 3% self and custom build and shall incldude 4 adult disability service units and up to 80 apartments for age restricted specialist accommodation for the elderly;

(2) 80 bed care home (C2);

(3) a local centre providing retail, employment and community facilities, healthcare, and a mobility hub;

(4) a two-form entry primary school;

(5) new areas of accessible greenspace including a linear park providing areas of amenity open space, children's playspace, habitat creation, sustainable drainage, and community growing space and/or allotments;

(6) the relocation of an area of playing fields to Longcroft and the construction of a two changing room sports pavilion annex;

(7) formalisation of the existing over-spill car park for temporary and occasional use;

(8) a new all modes access constructed onto Harpenden Road and the introduction of modal filters on Sandridgebury Lane and Valley Road;

(9) internal roads, cycleways, footways and drainage infrastructure; and

(10) the creation of a new footway and cycleway extending from Sandridgebury Lane to the Hertfordshire Way.

3.5 The arrangement of these land uses across the application site are shown on the parameter plans at Appendix 3.1 and illustrative framework plan at Appendix 3.2.

Parameter plans

3.6 The parameter plans included at Appendix 3.1 are the controlling plans (along with the red line site boundary) that will be formally approved with the grant of planning permission. They inform the EIA that has been undertaken for the proposals and reported in the ES.

Table 3: Parameter plans

TITLE	DRAWING	INFORMATION PROVIDED
Land use parameter plan	DE_565_72 Rev D	The broad arrangement of land uses within the site
Access and movement plan	DE_565_73 Rev D	The internal access arrangements and points of connection to the site
Green and blue infrastructure parameter plan	DE_565_74 Rev D	The broad arrangement for blue and green infrastructure within the site
Building heights plan	DE_565_075 Rev D	The maximum height of buildings within development area

3.7 These illustrate in diagrammatic form the disposition of land uses proposed across the application site as follows:

(1) The spatial distribution of proposed uses;

(2) The location and type of various points of access and the primary movement corridor; and

(3) The areas of green infrastructure to be retained and created.

3.8 The parameter plans are to be approved drawings in the event planning permission is granted and later stage reserved matters application are to accord with them.

3.9 Pursuant to the grant of outline planning permission, reserved matters approvals for scale, appearance, layout and landscape will in any event be required for those parts of the development where these details have been reserved.

Illustrative Framework

3.10 An illustrative framework is submitted with the outline application and is included at Appendix 3.2. This demonstrates in pictorial form the combined arrangement of land uses in plan form across the site. It is founded upon the parameters plans referred to at paragraph 3.6 but remains illustrative and will not be an approved plan.

3.11 The Design and Access Statement explains the design approach associated with the disposition and arrangement of land uses. It shows the character areas proposed, their spatial typologies, movement hierarchy and the nature of different aspects of green infrastructure.

Playing fields

3.12 An area of land measuring circa 5 hectares comprises playing field that are part of the existing Woollam Playing Fields and leased to the Old Albanian Sport Association. These are laid out as three rugby pitches over which a cricket pitch is laid.

3.13 The same configuration of playing pitches is to be relocated to Longcroft as shown on the drawings listed in Table 4 and included at Appendix 3.3. These will fully replace those to be developed, along with a new sports pavilion annex required by England and Wales Cricket Board.

Table 4: Playing field drawings

TITLE	DRAWING
Sports pavilion annex	De_565_012 Rev C
Proposed floor & roof plan	DE_565_013 Rev B
Existing context plan	DE_565_78 Rev C
Proposed context plan	DE_565_79 Rev C
Existing site plan	DE_565_80 Rev C
Site layout plan	DE_565_81 Rev D
Proposed fencing / enclosure plan	DE_565_82 Rev C
Advanced planting specification	DE_565_103 Rev A

3.14 These will be approved plans. This enables the playing field works to be undertaken as the first element of the development to allow relocation prior to vacant possession and thus safeguarding the continuous and uninterrupted use of playing fields.

3.15 To form the playing field are the following works are required:

a. A plateau will be formed through engineering works and planted to create suitable playing surfaces. The specification associated with this is set out in the TGMS Report.

b. A means of enclosure shall be erected around the playing field area incorporated into which will be landscaping and habitat creation.

c. New drainage infrastructure shall also be formed included an attenuation basin that discharges to a ground and is separate from the site wide drainage scheme.

d. A two-team changing room sports pavilion annex will also be constructed to meet the requirements of the England and Welsh Cricket Board.

e. An area of hardstanding to accommodate (153 parking spaces) and drainage infrastructure.

f. Subject to the need identified in the ball-strike report, ball-strike netting shall be erected seasonally, albeit the posts to which the nets are fastened shall remain in place.

Housing

3.16 The principal component of the proposed development is new housing. The Land Use Parameter Plan identifies approximately 18.25ha of developable land for housing (excluding the local centre). This area would provide some 800 new homes at an average density of 44 dwellings per hectare. In addition to this, within the local centre, there will be up to some 200 additional dwellings in form of apartments, townhouses, adult care self-contained disability support units, and age restricted specialist accommodation for the elderly (80 no. apartments). A care home (C2) (80 no. bedrooms) is also proposed.

3.17 The Building Height Parameter Plan illustrates that the new housing will range between 2 and 4 storeys in height. In broad terms, building heights, and density, will be greatest at the Local Centre with a lower density at application site's north-eastern corner.

Local centre

3.18 Community facilities will be provided as part of the proposed development along with a new two-form entry primary school. A new mixed use local centre will comprise retail, office, community facility, healthcare, age restricted specialist housing for the elderly, adult disability service units, and market and affordable housing. A mobility hub and EV charging will also be provided. The arrangements of the local centre buildings and spaces on the Illustrative Framework Plan optimises public realm and servicing requirements.

Primary school

3.19 A new two-form entry primary school is proposed, the location of which is shown in the Land Use Parameter Plan. This measures 2 hectares in size and is situated in close proximity to the local centre thus contributing to the critical mass of uses and at the confluence of east-west and north-south movement corridors. The applicants intend that the primary school is subject to a community use agreement enabling greater utilisation of its premises and facilities; this will be a matter for the Local Education Authority ("LEA") to determine in due course. The applicants intend to transfer the land to the LEA at an appropriate time in the project.

Green and blue infrastructure

3.20 The Green Infrastructure Parameter Plan identifies where existing vegetation is to be retained and where new landscape and habitat creation is proposed. The Landscape Strategy (DE_565_102) depicts how these various areas will be used and planted accordingly. This strategy is the basis of the biodiversity net-gain calculation that has been undertaken and which records a positive return in excess of the 10% required by the Environment Act 2021.

3.21 A buffer to Longspring Wood is shown on the land use plan, consistent with standing advice relating to Ancient Woodlands. The Landscape Strategy intends that the buffer zone is planted with semi-natural habitats.

3.22 In accordance with established policy the proposed development will implement sustainable drainage systems ("SuDS") to positively manage surface water throughout the development.

3.23 The drainage scheme will capture, convey, treat and manage surface water, principally by means of above-ground nature-based solutions. The surface water will be conveyed to an infiltration basin located in the easternmost part of the area of open space. The proposed SuDS train provide multi-functional spaces integrating with the existing landscape to enhance biodiversity and create complimenting habitats and treat water quality treatment before being discharged to the ground.

Access and movement

3.24 Proposed access drawings are listed in Table 5 and are included at Appendix 3.4.

Table 5: Proposed Access Drawings

TITLE	DRAWING
Harpenden Road signalised site access	05920-CI-A-001 P04
Sandridgebury Lane arrangement	05920-SK-008-P1
Sandridgebury Lane turning loop	05920-SK-006-P2
Valley Road modal filter	05920-SK-010-P2

3.25 A new junction is to be formed on to Harpenden Road as shown on drawing 05920-CI-A-001 P04. The principle of this was agreed by Hertfordshire County Council Strategic Transport Infrastructure Board in 2020. This will comprise a traffic signal-controlled T-junction with the proposed site access forming the minor arm.

3.26 The site access proposals incorporate protected active travel infrastructure along the site access arm and along Harpenden Road to the south connecting to the committed facilities being delivered as part of the off-site mitigation being delivered by the adjacent Sewell Park. To the north of the junction active travel infrastructure will be provided to the Old Albanians Sports Ground Access. The proposals will allow for the future delivery of high-quality active travel infrastructure along National Cycle Route 6 to Harpenden as proposed within the Local Cycling and Walking Infrastructure Plan. Traffic signal

controlled active travel crossings of Harpenden Road and the site access will be incorporated within the traffic signal control at the junction.

3.27 To enhance public transport accessibility, it is proposed that the existing stops to the north and south of the proposed site access are consolidated into a single pair of bus stops close to the site access junction. These will incorporate bus shelters and raised boarding platforms and will replace the existing poles. The primary road enables a bus route to be formed between Harpenden Road and the local centre. This will facilitate the extension of service 651 into the development.

3.28 To deliver the junction it is proposed that the existing 30mph speed limit along Harpenden Road is extended approximately 400m north to encompass the new site access junction and the access to the Old Albanian's Sports Ground. Within the site it is proposed that all roads are subject to a 20mph speed limit.

3.29 A network of footways, cycleways and roads will be provided within the development. The land use parameter plan depicts the primary access road which will comprise carriageway and segregated footways and cycleways complaint with LTN1/20. The alignment of routes within the individual development parcels will be determined at the reserved matters stage pursuant to "layout", whilst the Transport Assessment provides a description of the intended street hierarchy.

3.30 Sandridgebury Lane extends through the application site connecting Harpenden Road and Sandridge. It is proposed that, within the application site this re-routed within the area of built development and that Sandridgebury Lane is used as a green lane only within the site, affording a priority to walking and cycling. Vehicular access would be restricted by the introduction of a modal filter to the west of the existing railway bridge. A modal filter is also proposed at Valley Road to limit its use to pedestrian and cyclists again affording these modes of travel a priority. These principles, shown on drawings 05920-SK-008-P0, 05920-SK-006-P1 and 05920-SK-010-P1 have been discussed and agreed with Hertfordshire County Council.

3.31 A new footpath and cycleway is proposed to extend from Sandridgebury Lane (St Albans City 096) to the Hertfordshire Way (Sandridge 009). This would be a recreational route to provide access to the countryside footpath network to the north the application site and Heartwood Forest. These principles have been discussed and agreed with the Hertfordshire County Council Public Right of Way Officer.

Infrastructure

3.32 Infrastructure common place with large-scale mixed use development is also to be provided. This will include the installation of below ground foul water sewers and services, surface water drainage as described above, and footways and cycleways and roads. A foul water pumping station may also be required.

Carbon net zero

3.33 North St Albans will be designed, delivered and operated to fully support the transition to a net zero economy. All buildings on site will be designed with high levels of energy efficiency and generate a significant amount of their heat and power from renewable energy technologies, to achieve net-zero for regulated emissions.

3.34 Once occupied, residents of North St Albans will be provided with the infrastructure and technology to live a net zero lifestyle, enabling walking and cycling to school and key services and facilities within St Albans. All homes will be provided with access to electric vehicle charging infrastructure and their homes will be 'smart energy' enabled to allow residents to generate and use power at optimum times during the day to minimise energy costs and carbon emissions.

DELIVERY PROGRAMME

3.35 The EIA assumes that the construction of the proposed development will commence on site in 2026, with first completions likely 2028-29 and will assume delivery of the completed development (1,000 dwellings) by 2036. Table 6 provides an indicative delivery programme.

Table 6: Delivery programme (indicative)

26-27	27-28	28-29	29-30	30-31	31-32	32-33	33-34	34-35	35-36	Plan Period
Pitches	Pitches / Site Preparation works	50	75	100	100	125	150	200	200	1,000

3.36 This delivery timescale is considered realistic and readily achievable in light of the build rates experienced on developments of comparable scale elsewhere. New residential dwellings will be delivered, and occupied, throughout this period. The construction and operational phases will run in parallel, from the date of the first completion/occupation to the date of the last completion/occupation.

3.37 An indicative phasing plan has been prepared and is included at page 150 of the Design and Access Statement. In broad terms, development will commence adjacent to Harpenden Road and proceed in a eastern and south eastern direction.

3.38 Areas of green infrastructure will be laid out in phases alongside the construction and occupation of the new houses. The provision of drainage infrastructure is a central part of the phasing strategy.

3.39 The replacement playing pitches will be delivered and occupied prior to construction starting on the residential development. The Old Albanian Sports Association must be able to use the replacement playing pitches before the existing pitches can be removed and that land can be used to construct the new access road. Construction traffic associated with the earthworks for laying out these playing fields The replacement pitches will require two full growing seasons, so assuming development can start in spring 2026, construction for the residential development could begin in autumn 2027.

3.40 The local centre will be delivered in the early stages of development where feasible and reasonable, with a view to establishing positive travel patterns and supporting the sustainable growth of the new community.

3.41 There is also the opportunity to provide temporary meanwhile uses in the local centre whilst the neighbourhood population increases prior to the construction of retail and community facilities but this will need to be agreed with the LEA who will benefit from the transfer of the primary school land.

CONSTRUCTION ACTIVITIES

3.42 Construction activities are typical of this type of development project and will comprise earthworks, the creation of development plateaus', below ground excavation for foundations and service runs and drainage, surface excavations for attenuation basins, the creation of new highways, footways and cyclepaths, construction of buildings and dwellings. A haul road would be formed as part of the construction phases to enable movement of equipment and contractors across the site.

3.43 A temporary construction compound will be formed that will house equipment, materials, site offices and welfare facilities. Fencing and other means of enclosure will be employed to screen and secure such a compound. A temporary concrete batching plant may also be erected.

4 Approach to assessment

4.1 This section of the ES describes the methodology that has been employed to undertake the EIA and present the conclusions in the ES.

EUROPEAN UNION DIRECTIVE 2011/92/EU (AS AMENDED BY 14/52/EU)

4.2 Environmental Impact Assessment is a procedure required under the above EU Directive to assess the effects of certain public and private projects on the environment. Article 2 requires, "*before development consent is given, projects likely to have significant effects on the environment by virtue, inter alia, of their nature, size or location are made subject to a requirement for development consent and an assessment with regard to their effects on the environment*". Article 8 states that such an assessment is to be duly taken into account in the development consent procedure.

4.3 Following the UK departure from the European Union, the EIA Regulations have been transposed into UK law.

TOWN AND COUNTRY PLANNING (ENVIRONMENTAL IMPACT ASSESSMENT) REGULATIONS 2017

4.4 The EIA Directive is enacted into England Legislation in the Town and Country Planning (Environmental Impact Assessment) Regulations 2017.

4.5 The Regulations apply to two types of projects:

Schedule 1 Projects for which an EIA is required in every case; and

Schedule 2 Projects for which an EIA is required only if the particular project in question is judged likely to give rise to significant environmental effects.

4.6 *Schedule 3* outlines the selection criteria for screening Schedule 2 development.

4.7 In this instance it has been deemed that the proposed development does constitute Schedule 2 Development under the terms Urban Infrastructure Project.

4.8 *Schedule 4* prescribes information to be included in an Environmental Statement.

ENVIRONMENTAL TOPIC AREAS

4.9 Regulation 4(2) states that the EIA must identify, describe and assess in an appropriate manner, in light of each individual case, the direct and indirect significant effects of the proposed development on the following factors:

- Population and human health;
- Biodiversity, with particular attention to species and habitats protected under Directive 92/43/EEC (34) and Directive 2009/147/EC(35);
- Land, soil, water, air and climate; and
- Material assets, cultural heritage and the landscape.

4.10 The EIA process is intended to consider only likely significant effects. Potential significant environmental effects exist across a range of the above topics and therefore the applicants have defined the scope of the EIA to include the following environmental matters:

- Ecology and biodiversity;
- Landscape and visual;
- Agriculture and soil;
- Heritage and archaeology;
- Ground conditions;
- Water resources;
- Socio-economics, to include a separate Health and Impact Assessment;
- Water and material assets;
- Climate change;
- Traffic and movement;
- Noise and vibration;
- Air quality; and
- Cumulative effects.

4.11 These environmental topic areas are considered in Chapters 6 to 18.

CONSULTATION

4.12 To undertake the EIA, information has been gathered from a number of relevant organisations with whom the Applicants have consulted. These are listed in the individual environmental topic chapters.

CRITERIA TO ASSESS ENVIRONMENTAL EFFECTS

4.13 The main focus of the EIA process is the prediction and evaluation of the impact of the proposed development on relevant aspects of the environment. The terms “impacts(s)” and “effect(s)” are used interchangeable in the ES depending on context but represent the change that will occur.

4.14 The results and credibility of an EIA depend largely on the methodologies used to assess and determine the effect of a project. The respective methodologies are described in the individual environmental topic chapters

4.15 Assessing the significance of impact relies on the interaction between:

(1) The sensitivity of the environmental receptor; and

(2) The magnitude of change to that environmental receptor.

4.16 The sensitivity of a receptor / resource is determined by evaluating a receptor’s susceptibility to change and can be analysed from the baseline information. A value can then be ascribed to the various receptors or resources. This may be summarised and classified in a table, a rudimentary example of which is provided at Table 7.

Table 7: Criteria for defining sensitivity of environmental receptors of resources.

SENSITIVITY	RECEPTOR
High	The receptor/resource has little ability to absorb change without fundamentally altering its present character, or is of international or national importance.
Moderate	The receptor/resource has moderate capacity to absorb change without significantly altering its present character, or is of high importance.
Low	The receptor/resource is tolerant of change without detriment to its character, is of low or local importance.

4.17 Magnitude of change is the extent to which the proposed development will result in a change to an environmental receptor or resource. When assessing the magnitude of change, the scale, duration, timing and extent of effects, as well as the degree of certainty in the prediction of impacts and the likelihood of irreversible changes occurring should all be considered. Table 8 defines the type of change and magnitude.

Table 8: Criteria for defining magnitude of change to environmental receptors or resources

MAGNITUDE OF IMPACT	CRITERIA FOR ASSESSING IMPACT
High	Total loss or major/substantial alteration to key elements/features of the baseline (pre-development) conditions such as the post development character/composition/attributes which will be fundamentally changed.
Medium	Loss or alteration to one or more key elements/features of the baseline conditions such that the post development character/composition/attributes will be materially changed.
Low	A minor shift away from baseline conditions. Change arising from the loss/ alteration will be discernible detectable but not material. The underlying character/composition/attributes of the baseline condition would be similar to the pre-development circumstances/situation.
Negligible	Very little change from baseline conditions. Change barely distinguishable, approximating to a 'no change' situation.

4.18 Table 9 provides a matric showing the significance of the impact or effect derived from sensitivity and magnitude of change.

Table 9: Matric for determining significance of environmental effects

MAGNITUDE OF IMPACT	SENSITIVITY		
	High	Moderate	Low
High	Major	Major-moderate	Moderate-minor
Medium	Major-moderate	Moderate-minor	Minor
Low	Moderate-minor	Minor	Minor-negligible
Negligible	Negligible	Negligible	Negligible

4.19 There is no statutory definition of "significance". In this EIA/ES, the general significance criteria are outline and defined in Table 10.

Table 10: Matric for determining significance of environmental effects

SIGNIFICANCE OF EFFECT	DEFINITION
Major	An effect which in isolation could have material influence on the decision-making process.
Moderate	An effect which on its own could have moderate influence on decision making, particularly when combined with other similar effects.
Minor	An effect, which on its own is likely to have a minor influence on decision making, but when combined with other effects could have more material influence.
Negligible	An effect which on its own or in combination with other effects will now have an influence on decision making.

4.20 Effects can be:

- direct, indirect or secondary
- cumulative
- short, medium and long term
- permanent and temporary
- positive / beneficial or negative / adverse.

MITIGATION

4.21 Intrinsic to the EIA process is the formulation of mitigation measures and their incorporation into the proposed development.

4.22 Mitigation measures are divided into three broad categories as set out in Table 11.

Table 11: Types of mitigation measures

TYPES OF MITIGATION	EXAMPLES
Inherent mitigation	Measures designed into the scheme and certain to be delivered e.g., the provision of structural landscaping, habitat creation, community infrastructure shown on the parameter plans.
Standard mitigation	Measures which are commonplace as part of such development proposals and to which there is a high degree of certainty that they will be provided e.g., the preparation of a Construction Environmental Management Plan.
Actionable mitigation	Measures that will be secured by a controlling mechanism as part of a planning permission e.g., planning condition or planning obligation or other legal instrument(s).

4.23 Within each topic chapter, inherent and standard mitigation measures are considered as part of the assessment of environmental impacts, and actionable mitigation is included as part of the residual impact assessment.

THE SPATIAL SCOPE OF THE ASSESSMENT

4.24 The geographical or spatial scope of the EIA has regard to the physical extent of the proposed development. The spatial scope of each topic is set out in the individual topic chapters. Some assessments will be limited to the application site or its immediate surroundings, while others extend across a wider area.

THE TEMPORAL SCOPE OF THE ASSESSMENT

4.25 Potential significant environmental effects will be considered for both the construction phase and the operational phase. The broad timescales are shown in Table 12.

Table 12: Temporal scope of assessment

PHASE	TIMESCALE
Construction	10 years
Operation	100 years

4.26 The terminology for defining periods of time will be as follows unless specified differently in individual chapters:

- Short term 0-5 years
- Medium term 5-15 years
- Long-term 15+

CUMULATIVE ASSESSMENT

4.27 The Regulations require that assessment of the project also considers potential cumulative effects arising as a combination of this and other development projects. The Planning Practice Guidance refers to there being occasions when other existing or approved development may be relevant in determining whether significant effects are likely as a consequence of a proposed development.

4.28 There are two types of effect:

Type 1 effects arise from the proposed development itself where sensitive receptors are subject to various effects. The combined effects of individual effects resultant from the development upon a set of defined sensitive receptors. For example, human beings might be affected by changes in the noise environment and changes in visual amenity which together could result in an adverse or greater effect than the effect in isolation. How the proposed development could have these effects is considered at Chapter 16.

Type 2 effects are a result of changes to the baseline as a consequence of the proposed development in combination with reasonably foreseeable projects within the local area. In this instance, the LPA's Scoping Opinion has required a cumulative assessment of the proposed development in combination with development at Sewell Park. Each environmental topic chapter includes such a section.

ENVIRONMENTAL TOPIC CHAPTERS

4.29 The structure of each environmental topic chapter is shown in Table 13.

Table 13: Environmental topic chapters

SECTION	SCOPE/CONTENTS
Inherent mitigation	Outlines the scope of the individual chapter.
Assessment methodology	Refers to the specific methodology used within the chapter and is structured around the following headings: study area; consultation; legislative / planning policy context; assessment of process; assessment criteria; sources of information; and assumptions / limitations.
Baseline conditions	The section provides more detailed topic specific information to describe the character of the site and its environs (the study area). This baseline situation describes the quality of the interests on the application site as they relate to this environmental topic. This will identify the sensitivity of environmental receptors (i.e. high, medium or low). This description serves as a comparative measure against which changes arising from the construction and operational phases of the proposed development can be assessed or predicted.
Inherent and standard mitigation	A summary description of those 'inherent' and 'standard' mitigation measures which primarily address the scope to avoid, reduce or remedy adverse environmental impacts or enhance the beneficial aspects arising from the construction and operational periods of the proposed development relating only to the Topic Chapter. These are primarily explained in chapter 3 which describes the proposed development. (Actionable mitigation is considered in the assessment effects to establish residual effects).
Assessment of environmental impact	The identification and assessment of the nature, extent, magnitude and significance of environmental effects (including any, direct or indirect effects), which arise as a result of the construction and operational periods of the proposed development. This assessment will consider inherent and standard mitigation (e.g. strategic landscaping, habitat creation etc that is part of the proposed development)
Actionable mitigation	The identification of actionable mitigation employed where applicable to reduce the negative effects of the proposed development.
Residual effects	This section will identify residual effects. A description and assessment of significance of any effects that will remain after the inherent, standard and actionable mitigation measures are applied. These effects will be determined to be Major/Substantial, Moderate, Minor and Negligible.
Cumulative effects	The identification and assessment of the nature, extent, magnitude and significance of cumulative environmental effects arising from development at Sewell Park.
Summary and conclusion	Overall Summary and conclusions of the assessment.

5 Alternatives

5.1 This chapter provides an explanation of the main alternatives that the applicants have studied pursuant to the Regulations (Part 2, Schedule 4).

5.2 In this instance, the main alternative scenarios comprise:

a. "Do nothing"

b. Consideration of an alternative strategic development proposal; and

c. Consideration of an alternative configuration of development within the application site.

5.3 Each of these potential alternatives is considered in the following paragraphs which explain the applicant's choice.

DO NOTHING

5.4 The application site is not identified in the District Council's Local Plan for development. In the "do nothing" scenario it would remain in its current state; used in part as playing fields with the remainder as agricultural land. Its baseline condition is therefore unlikely to change to any material extent.

5.5 A new Local Plan is being prepared by the District Council that cover a period up until 2041. It is having to address current and future development needs that are not catered for in the previous Local Plan. The District Council has identified land to the North of St Albans as a potential future development location since 2014 and has proposed to allocate this land for new housing and associated uses both in its 2018 Regulation 19 Local Plan, the 2023 Regulation 18 Local Plan consultation and the 2024 Regulation 19 Local Plan consultation. The application site is a substantial part of the land identified by the LPA as the North St Albans Broad Location.

5.6 Were the application site not to be developed for housing and associated uses, the beneficial social, economic and environmental affects described in later chapters would not be realised. The positive contribution to meeting the identified need for new housing, in a location adjacent to the main settlement in the District and accessible to a range of services and facilities would not be realised. Likewise, none of the adverse environmental effects identified in this assessment would occur. The land would likely continue to be farmed in the present manner and the playing fields would continue to the used by OASA. In the near future, the site would be adjoined by new housing at Sewell Park.

5.7 The LPA's Sustainability Appraisal ("SA") identifies that there is no justifiable basis to provide less housing in the District than the level which the Regulation 19 Local Plan consultation intends. In this situation, to meet the identified need for new housing in the District, other land would need to be developed.

AN ALTERNATIVE STRATEGIC DEVELOPMENT PROPOSAL

5.8 The Local Plan preparation process has considered options for how future development needs can be meet in the District. This is explained in the SA and consideration of reasonable alternatives. The spatial strategy is focused on locating development at the main settlement, St Albans City, to reflect the fact that amongst things it provides a greater range of services and facilities which can reduce the need to travel as they offer greater accessibility by walking cycling and public transport. The SA refers to "...*a clear strategic case for Green Belt release at St Albans*" (para 5.4.43)

5.9 The LPA has undertaken a comparative site assessment to determine the list of sites it has proposed as allocations in both the Regulation 18 and Regulation 19 consultation documents. JBA has undertaken a Strategic Flood Risk Assessment (Levels 1 and 2) on behalf of the LPA that has considered various sources of flooding. Given that North St Albans is one of the preferred sites overall

in the District and at St Albans City because of its locational characteristics, its proximity to the main settlement in the District and this accordance with the spatial strategy, and the limited extent of environmental constraints, other sites would be less preferrable with poorer locational characteristic and greater environmental constraints.

5.10 As such, and where the likely significant adverse effects of the proposed development have been judged to be limited in extent, in contrast to its many beneficial effects, the applicant has chosen to proceed with the submission of the planning application rather than an "alternative strategic development proposal" and has not considered that as part of the EIA process.

CONSIDERATION OF AN ALTERNATIVE CONFIGURATION OF DEVELOPMENT WITHIN THE NORTH ST ALBANS BROAD

5.11 The area of land which comprises the North St Albans Broad Location is shown on Appendix 2.2.

5.12 To the west of the application site is Sewell Park, which benefits outline planning permission. Associated with this is a parameter plan that determines the arrange of land uses on that land. The proposed development must (1) ensure connectivity with that land; (2) ensure appropriate separation to safeguard residential amenity; and (3) protect the hedgerow and trees that from the boundary between these two areas. These are factors that to an extent influence how development is most appropriately arranged within the application site.

5.13 Access to the proposed development site must be achieved from Harpenden Road and that requires the existing playing fields to be relocated in the first instance. For the new playing fields to retain their utility as part of the Woollam Playing Fields complex they must be contiguous with it. There is no scope for those playing fields to be cited elsewhere within the area of the Broad Location and achieve that requirement. This is a fundamental factor that influences how development is arranged within the application site.

5.14 The applicants and the LPA previously prepared a Draft Masterplan for the North St Albans Broad Location in 2020. Whilst this does not have a formal status, it reflects a great deal of collaborative working within a series of environmental constraints, namely, Longspring Wood, the railway line, Sandridgebury Lane and Valley Road and their associated boundary vegetation, and the topography of the site generally. It culminated in a Framework Plan that arranges land uses across the site taking account of these constraints.

5.15 Since that time there has not been a material change in (1) the environmental characteristics of the application site; or (2) the intended component parts of the proposed development, and consequently the arrangement of land uses remains appropriate. Changes in guidance as to the performance measures of infrastructure (e.g., surface water attention, climate change allowance, and habitat creation and biodiversity net gain) have been considered. The Regulation 19 Local Plan consultation document identifies specific development requirements that are broadly comparable to those in the 2018 consultation document. Consequently, a materially different arrangement of land uses is therefore unlikely.

5.16 The land use parameter plan illustrates the arrangement for which permission is sought. Where changes have occurred from the 2020 Framework Plan, they relate to the placement of development, landscaping or drainage features but the broad structure remains the same. Further modest changes to the placement of development within the broad outline is unlikely to result in new or materially different environmental effects than have been assessed. On this basis, an alternative arrangement of land uses has not been considered as part of the EIA process.

6 Ecology and biodiversity

6.1 This chapter of the ES has been prepared by FPCR Environment and Design Ltd to evaluate the effects of the proposed development on the ecology and biodiversity assets within the site and as necessary its surroundings.

6.2 Ecological surveys have been undertaken since 2017 to determine the presence of important ecological features ("IEFs"). On site IEF have been considered in the context of connectivity to offsite population or assemblages. This forms a baseline of habitat types and protected species and their respective values.

6.3 This chapter should be read in conjunction with the following supporting figures and technical appendices:

Figure 6.1: Site location plan
Figure 6.2: Designated sites plan
Figure 6.3: UK habitats plan
Figure 6.4: Farmland bird mitigation Plan
Appendix 6.1: Badger survey report
Appendix 6.2: Bat survey report
Appendix 6.3: Biodiversity net gain report
Appendix 6.4: Breeding bird survey report
Appendix 6.5: Dormouse survey report
Appendix 6.6: Reptile survey report
Appendix 6.7: Wintering bird survey report
Appendix 6.8: Arboricultural impact assessment

ASSESSMENT METHODOLOGY

6.4 This assessment has employed guidance from the Chartered Institute of Ecology and Environmental Management ("CIEEM") (2018)[1]. The impact assessment process involves *"identifying and characterising impacts; incorporating measures to avoid and mitigate (reduce) these impacts; assessing the significance of any residual effects after mitigation; and identifying appropriate compensation and enhancement measures to offset significant residual effects."*

6.5 The starting point for the assessment of impacts is to determine the IEFs and which should be subject to detailed assessment. Ecological features can be important for a variety of reasons, for example, the quality of designated sites or habitats, habitat/species rarity, or their rate of decline.

Study area

6.6 The scope of the assessment focused primarily the application site boundary as identified on Figure 6.1. In addition, a 34ha field to the north east under the same land ownership, was also surveyed to determine its potential to accommodate mitigation measures for farmland bird species. The ecological characteristics of the site and its environs are described in Chapter 2.

Consultations

6.7 Relevant ecological information was sourced from the following organisations/resources Hertfordshire Environmental Records Centre ("HERC"); Multi Agency Geographic Information for the

[1] Chartered Institute of Ecology and Environmental Management (CIEEM) (2018). Guidelines for ecological impact assessment in the UK and Ireland -Terrestrial, Freshwater, Coastal and Marine. Online at < ECIA-Guidelines-2018-Terrestrial-Freshwater-Coastal-and-Marine-V1.2-April-22-Compressed.pdf (cieem.net)>.

Countryside ("MAGIC") website[2]; St Albans City and District Council planning portal[3]; Colour 1:25,000 OS base maps; Aerial photographs from Google Earth. Meetings with St Albans District Council and Hertfordshire County Council have been held to discuss ecological and biodiversity matters and have informed the landscape and habitat creation measures.

6.8 The search area for biodiversity information was related to the significance of sites and species with potential zones of influence, as follows:

(1) 15m around the application site for Sites of International Importance (e.g. Special Areas of Conservation ("SACs"), Special Protection Areas ("SPAs"), Ramsar sites).

(2) 2km around the application site for sites of National or Regional Importance (e.g. Sites of Special Scientific Interest ("SSSIs") and species records (e.g. protected, Local Biodiversity Action Plan ("LBAP") or notable species).

(3) 2km around the application site for sites of County Importance (e.g. Sites of Importance for Nature Conservation ("SINC")).

Legislative / planning policy context

Legislative context

6.9 The following international and national legislation are relevant to the ecology and biodiversity baseline value and effects of the development proposals.

(1) The Conservation of Habitats and Species Regulations 2017 (CHSR) (as amended)[4] in relation to the European Protected Species (EPS) bats (all species) and hazel dormouse *Muscardinus avellanarius*; and European protected sites i.e. Special Areas of Conservation (SAC) and Special Protection Areas (SPAs) collectively called national site networks and International protected "Ramsar Sites". Annex II bat species of particular relevance in relation to SACs designated for bats.

(2) The Wildlife and Countryside Act 1981 (WCA) (as amended)[5] in relation to all wild birds (including Schedule 1 species), other animals (notably Schedule 5 species), flora (those listed in Schedules 8 and 9) and Sites of Special Scientific Interest (SSSI);

(3) The Countryside and Rights of Way Act 2000[6];

(4) The Environment Act 2021[7];

(5) Protection of Badgers Act (PBA) 1992[8];

(6) Natural Environmental and Rural Communities (NERC) Act 2006[9] in relation to various priority species and habitats;

(7) Local Nature Reserves ("LNR") as designated most recently by the NERC Act 2006;

(8) Non-statutory protected local sites including County Wildlife Sites ("CWS"), SINCs, LWS, and Ancient Woodland Inventory (AWI) sites;

(9) Local Biodiversity Action Plans ("LBAP")[10];

(10) Birds of Conservation Concern ("BoCC")[11]; and

(11) Hedgerow Regulations 1997 made under Section 97 of the Environment Act 1995[12];

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[2] MAGIC - https://magic.defra.gov.uk/ [Accessed 31.05.24].

[3] St Albans City & District Council Planning Portal - View and track planning applications | St Albans City and District Council [Accessed 31.05.24].

[4] HMSO. The Conservation of Habitats and Species Regulations 2017 (as amended)-No. 1012

[5] HMSO. The Wildlife and Countryside Act 1981 (as amended).

[6] HMSO (2000) The Countryside and Rights of Way Act 2000

[7] HMSO (2021) The Environment Act

[8] HMSO (1992) The Protection of Badgers Act

[9] HMSO (2006) Natural Environment and Rural Communities Act.

[10] Herts and Middlesex Wildlife Trust (2006) A Biodiversity Action Plan for Hertfordshire.

[11] Stanbury, A., Eaton, M., Aebischer, N., Balmer, D., Brown, A., Douse, A., Lindley, P., McCulloch, N., Noble, D., and Win I. 2021. The status of our bird populations: the fifth Birds of Conservation Concern in the United Kingdom, Channel Islands and Isle of Man and second IUCN Red List assessment of extinction risk for Great Britain. British Birds 114: 723-74.

[12] HMSO (1997) The Hedgerow Regulations.

The Conservation of Habitats and Species Regulations 2017 (as amended)

6.10 These Regulations transpose the European Council Directive 92/43/EEC (EC Habitats Directive) into national law. The purpose of this legislation is to provide protection for natural habitats, wild flora and fauna of international importance. Several species are afforded wide-ranging protection under Schedule 2 of the Regulations.

6.11 Part 2 of the Regulations affords protection to sites of International importance for habitats or species which rely on these habitats, such as: RAMSAR sites; SAC and SPA. Part 3 of the Regulations provides protection for species (plant and animals) as listed on Schedules 2 and 4 that are considered to be of importance. Part 5 of the Regulations provides a mechanism by which a licence can be obtained for operations that would otherwise be unlawful under the Regulations.

Wildlife and Countryside Act 1981 (as amended) (WCA)

6.12 The WCA provides special protection of selected species. Under Section 1(1) and 1(2), all British bird species, their nests and eggs (excluding some pest and game species) are protected from intentional killing, injury or damage. Under Sections 1(4) and 1(5), special penalties are applied to bird species included in Schedule 1 of the WCA and protection is extended for these species to disturbance whilst building, in or near a nest and disturbance to dependent young. Schedule 5 provides special protection animal species other than birds, through paragraph 9(4) of the WCA, against damage to "any structure or place which any wild animal (included in the schedule) uses for shelter and protection" and against disturbance whilst in such places.

The Countryside and Rights of Way Act 2000 (CRoW Act)

6.13 The CRoW Act amends Section 1(5) of the WCA by introducing a new offence of "reckless" disturbance to protected wildlife and making certain offences punishable by imprisonment.

Natural Environment and Rural Communities Act 2006 (NERC)

6.14 The NERC provides protection for habitats or species that are considered to be of principal importance to biodiversity. The legislation requires public authorities, including local planning authorities, to conserve biodiversity when exercising their functions. A list of habitats/species of principal importance, based on the former UK Biodiversity Action Plan (BAP) lists of priority habitats and species that have been produced by the Secretary of State in consultation with Natural England.

Policy context

National Planning Policy Framework (NPPF) 2023

6.15 The NPPF sets out the Government's planning policies for England and how these are expected to be applied within the planning system. Chapter 15 concerns the conservation and enhancement of the natural environment.

6.16 The UK Biodiversity Action Plan (UKBAP) has now been superseded by the UK Post 2010 Biodiversity Framework and Biodiversity, the former UKBAP lists of priority habitats and species continue to be regarded as conservation priorities under the NPPF, and they have been used to compile the statutory lists of priority species and habitats as required under Section 41 of the NERC Act 2006 (also referred to as Habitats and Species of Principal Importance (HPI and SPI)).

Local policy

6.17 The current adopted local plan for St Albans City and District is the District Local Plan Review 1994. Policy 106 concerns nature conservation. Ecological factors will be taken into account in determining planning applications and development proposals that have an adverse effect on designated sites or

protected species will not be permitted unless mitigation measures are proposed to protect the identified features.

Habitat Regulation Assessments

6.18 Following the assessments undertaken in 2008 and updated in 2018, it was concluded that the draft St Albans Local Plan 2018, including the application site, "*will not have likely significant effects on the Chilterns Beechwood SAC, either alone or in combination with other plans and projects.*"

6.19 Further consultation with Natural England in March 2019 confirmed that they "*agree with the conclusion of the Habitats Regulation Assessment (HRA) that there will be no likely significant effects on any European site*". This was further updated in 2022 with the creation of a 12.6km zone of influence around the Chilterns Beechwood, advised by Natural England to the local planning authorities.

Assessment criteria

6.20 The CIEEM guidance uses the geographical context to assign importance to ecological features, however for a uniformed approach to assessments of significance the methodology used in ES Chapter 4 uses a guiding matrix to compare the magnitude of predicted effects with the sensitivity of the receiving environment within which the impact (change) will take place. With the guiding significance thresholds being: major; moderate; minor or negligible

6.21 In order to produce outcomes which are consistent with the categories of significant residual effects used by other disciplines, Table 14 sets out an approach for reporting categories of the significant residual effects generated by application of the CIEEM EcIA guidelines without using the matrix format. These categories of significance of residual effect will only be used following completion of the assessment of whether the residual effects are significant or not in terms of conservation objectives or conservation status with reference to an appropriate geographical scale, in line with the CIEEM EcIA guidelines.

Table 14: Categorisation of the significance of a residual effect

GEOGRAPHICAL SCALE AT WHICH THE RESIDUAL EFFECT IS ASSESSED AS BEING SIGNIFICANT FOLLOWING THE CIEEM ECIA GUIDELINES	CATEGORY OF SIGNIFICANT EFFECT	SENSITIVITY
International, European, National, or Regional	Major	High/Medium
County	Moderate	Medium
Local/site	Minor	Low

Determining importance

6.22 CIEEM have identified various characteristics that can be used to identify ecological features or features likely to be important in terms of biodiversity. These include:

- *"Animal or plant species that are rare or uncommon, either internationally, nationally or more locally;*
- *Ecosystems and their component parts, which provide the habitats required by the above species, populations and/or assemblages;*
- *Endemic species or locally distinct sub-populations of a species;*
- *Habitat diversity, connectivity and or/synergistic associations (e.g. networks of hedgerows and areas of species-rich pasture that may provide important feeding habitat for rare species);*

- *Notably large populations of animals or concentrations of animals considered uncommon or threatened in a wider context;*
- *Plant communities (and their associated animals) that are considered to be typical valued natural/semi-natural vegetation types – these will include examples of natural species-poor communities;*
- *Species on the edge on their range, particularly where their distribution is changing as a result of global trends and climate change;*
- *Species-rich assemblages of plants and animals; and*
- *Typical faunal assemblages that are characteristic of homogenous habitats."*

6.23 Once an ecological feature has been identified as being important, guidelines promote the use of characterising this feature into the relevant geographic frame of reference. This allows the scale of significance of effects to be presented in a meaningful way and provides a focus on maintaining a feature at an appropriate scale. The known or potential value of an ecological feature within this assessment is considered within the following geographical context: International; National; Regional; County (i.e. Hertfordshire); and Local (i.e. St Albans). Site is not an official CIEEM category but relates to those effects that are only site based.

6.24 If an ecological feature is not considered to be important, the proposed development is not anticipated to have an effect that would be of relevance to the decision maker, and these features are not considered further within the assessment. Exceptions to this would be if the species, population or habitat in question was identified as having a high social or economic value or if they are afforded legal protection. While the assessment does include protected species that receive statutory protection and are material at the local level, the presence of such a species does not necessarily infer value in relation to the proposed scheme but only to the level of protection it receives.

6.25 As such, the value of the proposed scheme for protected species is considered by the specific ecological feature, taking into account the level of activity (or occurrence), the level of protection it receives and the overall value of habitat to that species within the site.

6.26 Features with a value of Local or above are considered to represent an IEF. Those features not meeting the criteria for IEF's are classified as having either lower than local level (immediate zone of influence, for example within a site context) or negligible ecological importance.

6.27 Evaluation of features which do not reach this scale of significance are otherwise recognised as being of negligible significance or as providing habitat diversity at a site level, but not considered to appreciably enrich the habitat resource at a local level.

Determining impacts and effects

6.28 The CIEEM guidelines define an impact as an influence on an ecological feature. The effect is the outcome of the influence on the ecological feature. It is important to assess whether an impact is defined as an effect (negative or positive) on the integrity of a defined site or ecosystem and/or the conservation status of a habitat or species within a given geographical area.

6.29 Impacts are identified and understood to be able to determine the likely effect (consequence) of that impact in relation to the ecological feature.

6.30 As part of the process of determining whether there is likely to be an effect on the status of an ecological feature, the following questions are considered:

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

6.31 A description of parameters that are considered when assessing the degree and type of change are detailed in Table 15.

Table 15: The parameters for describing impacts on ecological structure and function

PARAMETER FOR DESCRIBING IMPACTS ON ECOLOGICAL STRUCTURE AND FUNCTION	DEFINITION OF PARAMETER
Positive or negative	Whether the impact has a positive or negative effect
Extent	The area of which the effect occurs
Magnitude	The size or amount of an effect
Duration	The time for which the effect is predicted to last prior to recovery or replacement of the resource or features
Reversibility	Whether the effect is permanent (i.e. irreversible) or temporary (i.e. reversible)
Timing and frequency	How often the effect occurs (e.g., repeated noise from piling work) and when it occurs (e.g., vegetation clearance undertaken outside of the bird breeding season).

6.32 With reference to the duration of an ecological effect, Table 16 defines the timeframes used within this chapter in accordance with CIEEM guidance.

Table 16: The definition of duration of ecological effects

TERM	DEFINITION WITHIN THIS ASSESSMENT
Short-term	1-5 Years
Medium-term	6-15 Years
Long-term	16-60 Years

6.33 Once an effect is considered to be significant then the scale of effect is assessed on a geographical scale. For example, the effect may not be significant at a County scale, but significant at a more local scale. It is important to note that effects on features will need to be considered at more than one geographical scale.

Mitigation, compensation and enhancement

6.34 Impacts on ecological features are generally assessed without mitigation in place. It is noted that in some situations it is impossible to separate the mitigation from the proposed development as this is embedded into the scheme. In these situations, the embedded mitigation will be acknowledged and only the residual effects considered.

6.35 In line with current CIEEM guidelines, a sequential process, known as the 'mitigation hierarchy' should be adopted on negative ecological impacts and effects. This involves: (1) avoiding negative ecological effects; (2) reducing negative effects that cannot be avoided (mitigate); and (3) compensating for any remaining significant ecological effects.

Cumulative effects

6.36 Consideration of cumulative effects has considered the potential effects of other relevant development schemes in the vicinity, in combination with this proposed development. Sewell Park is relevant in this regard and is discussed later in the chapter.

Sources of information

6.37 The sources of information used to inform this assessment detailed within the individual protected species reports accompanying this ES, which have been detailed in paragraph 6.3 above. This include consultation desk studies and field surveys following best practice guidance to achieve a baseline data set from which assessments are made. The Landscape Framework Plan DE_565_102 Rev B has been used to complete the assessment of the impact on the environmental receptors identified.

Assumptions

6.38 The nature of the outline planning application means that the proposed landscape plans do not contain sufficient detail to inform specific details regarding management and mitigation measures. It has therefore been assumed that any details regarding these measures are rational and can be easily incorporated into the landscape proposals at detailed planning.

6.39 The biodiversity net gain assessment undertake for this assessment utilises a rational approach with regards to the proposed habitats and their individual condition targets. In addition to this the following ratios have been used to understand how biodiversity net gain will be achieved: residential development areas – 70:30 ratio between hardstanding: vegetated gardens; and commercial and school development areas – 90:10 between hardstanding: introduced shrub. Additional assumptions concerning the assessment of proposed habitat creation are set out in Appendix 6.3.

Assessment limitations

6.40 Survey limitations associated with the individual protected species surveys have been documented in the respective reports.

BASELINE CONDITIONS

Designated sites

6.41 The Chilterns Beechwoods SAC is situated at its nearest point approximately 14.5km west from the application site, as shown in Figure 6.1. The SAC is designated primarily for supporting an extensive tract of *Asperulo-fagetum* beech forest that lies at the centre of the habitat's UK range. *Asperulo-fagetum* beech forest is an important Annex I qualifying habitat type that supports a range of Atlantic woodland indicator species. The woodland itself is a key component part of a grassland-scrub-woodland mosaic.

6.42 Semi-natural dry grasslands and scrubland facies, on calcareous substrates, is a further Annex I habitat type present within the SAC. These grasslands are typically important orchid sites. Chilterns Beechwoods also supports the Annex II listed stag beetle *Lucanus cervis* that are a further qualifying feature as a SAC, though this is not a primary reason for its designation.

6.43 The Chilterns Beechwoods also encompasses various Sites of Special Scientific Interest (SSSIs) within its boundaries including Aldbury Nowers and Alpine Meadows, both of which largely comprise relatively small areas of unimproved calcareous grassland, with ancient semi-natural woodland, that support rich assemblages of plant species typical of unimproved chalk grassland.

Non-designated sites

6.44 Nine sites of local or county conservation interest were identified by HERC within 1km of the site boundary. Details regarding the ecological importance of each of these sites is detailed in Table 17.

Habitats

Arable

6.45 The majority of the site comprised of arable habitats (F2 to F5) supporting a series of cereal and non-cereal crops. Field margins are generally narrow, approximately 0-1m in width supporting grass species including false oat grass *Arrhenatherum elatius*, cocks foot *Dactylis glomerata* and Yorkshire fog *Holcus lanatus* as well as common and widespread herb species including common hogweed *Heracleum sphondylium*, hemlock *Conium maculatum*, common nettle *Urtica dioica* and creeping thistle *Cirsium arvense*.

6.46 A small arable headland is situated at southern extent of F2 which had previously been planted with annual flowering plants including corncockle *Agrostemma githago*, corn marigold *Glebionis segetum*, corn flower *Centaurea cyanus* and common poppy *Papaver rhoeas*. Due to lack of management this headland area has started to support more established grass species including annual meadow grass *Poa annua,* cocks foot, and red fescue *Festuca rubra*, as well as herbaceous species including germander speedwell *Veronica chamaedrys*, creeping buttercup *Ranunculus repens*, cleavers *Gallium aparine* and common mouse ear *Cerastium fontanum*.

6.47 Field compartment F1 to the west comprised of well managed amenity grassland abundant with perennial rye grass *Lolium perenne* and supporting low herbaceous diversity typical of intensive management including such as common daisy *Bellis perennis*, common mouse ear, common ragwort, perennial sow-thistle *Sonchus arvensis* and self-heal *Prunella vulgaris.*

Woodlands

6.48 There are a range of broadleaved woodland belts throughout the Application site planted with broadleaved tree species including ash, hawthorn, field maple, wild cherry, pedunculate oak and hazel. These woodlands varied in age, with woodlands W1 and W5 supporting semi mature tree species with a sparse woodland ground flora including hedge bedstraw *Galium mollugo,* upright hedge parsley *Torilis japonica,* and wood avens. In contrast W3 and W4 supported mainly immature tree species with a mixed understory of tall grassland and sparse scrub including holly, bramble and elder.

6.49 Longspring Wood (W4) supports a belt of lowland mixed deciduous woodland priority habitat, which is further designated for being an ancient woodland. Located along the southern boundary of F4, it comprised of semi-natural broadleaved tree species and a sporadic understorey comprised dense shrubs and open glades. Ancient woodland ground flora including bluebell Hyacinthoides non-scripta, ivy leaved speedwell *Veronica hederifolia*, pignut *Conopodium majus* and wood mellick *Melica uniflora* are present alongside dense patches of bramble *Rubus fruticosus* agg scrub and areas of tall ruderal vegetation. Informal footpaths were present throughout the woodland and connected to the industrial and residential developments to the south.

Hedgerows

6.50 There are a total of 18 hedgerows bounding the fields that support more than 80% native species within their canopy, thus classifying them as a NERC S41 habitat of principal importance; species included hawthorn, pedunculate oak, blackthorn, field maple, holly, elder and hornbeam. Hedgerows H1, H5 and H9 are considered 'important' under ecological criteria of *The Hedgerow Regulations 1997* due to the number of species present and associated features.

Offsite mitigation fields

6.51 Two fields totalling approximately 34ha in size, located 400m north of the application site, were identified as mitigation areas for farmland bird assemblages. These fields are under the same land ownership and agricultural management, supporting cereal crops with similar arable margin habitats as recorded across the rest of the site.

Table 17: Non-statutory Site Designations within 1km of the site

LOCAL WILDLIFE SITE	DISTANCE	BEARING	REASONING
Longspring Wood	On-site	South	A small ancient woodland comprised of semi-natural pedunculate oak *Quercus rober* and hornbeam *Carpinus betulus* coppice, with standards of ash *Fraxinus excelsior* and beech *Fagus sylvatica*. The woodland also supports two thickets of elder *Sambuca nigra*, hawthorn *Crataegus monogyna* and blackthorn *Prunus spinosa*. Ground flora includes woodland indicators such as bluebell *Hyacinthoides non-scripta*, wood millet *Milium effusum*, Dog's Mercury *Mercurialis perennis*, Yellow archangel *Lamiastrum galeobdolon* and pignut *Conopodium majus*.
Beech Bottom Dyke	0.27km	South	An area of Iron Age earthwork that supports old secondary, possibly ancient woodland comprised of pedunculate oak and hornbeam coppice and standards, with occasional ash, beech and wild cherry *Prunus avium*. The ground flora is diverse and includes many woodland indicators such as bluebell, wood anemone *Anemone nemorosa,* remote sedge *Carex remota*, wood melick *Melica uniflora* and pignut. The woodland also supports several fern species including Lady fern *Athyrium filix-femina*, broad buckler-fern *Dryopteris dilatata*, scaly male fern *Dryopteris affinis* and soft shield-fern *Polystichum setiferum*.
Kilmart's Spring Wood	0.55km	Northwest	A small ancient woodland comprised of semi-natural pedunculate oak and hornbeam, with occasional ash, wild cherry and field maple *Acer campestre*. The wood supports a varied ground flora that includes many indicator species such as bluebell, yellow archangel, broad buckler-fern, dog's mercury, and wood meadowgrass *Poa nemoralis*, with locally abundant bracken *Pteridium aquilinum*.
Langley Wood	0.73km	Northeast	Ancient woodland comprised of semi-natural pedunculate oak and hornbeam, with dense hornbeam coppice and a few oak standards. The ground flora is relatively limited in species diversity and is dominated by bluebell and wood anemone, and features other indicator species including pignut, yellow archangel and wood meadowgrass.
Batchwood	0.75km	Southwest	Ancient woodland comprised of semi-natural pedunculate oak and hornbeam coppice-with-standards on a chalk substrate dry valley. The western part has been planted with Corsican Pine *Pinus nigra ssp. Laricio*. Primary coppiced species are hornbeam and hazel *Corylus avellana*. The ground flora is relatively diverse, included various woodland species dominated by bluebell. Other species recorded included moschatel *Adoxa moschatellina*, ramsons *Allium ursinum*, slender buckler-fern *Dryopteris carthusiana*, wood sorrel, Goldilocks buttercup *Ranunculus auricomus* and common dog-violet *Viola riviniana*. Two orchid species have also been recorded; violet helleborine *Epipactis purpurata* and early purple orchid *Orchis masculata*.
Jersey Farm Open Space	0.77km	East	An area of public open greenspace between St. Albans and Sandridge, which has been partly reseeded as a wildflower meadow. Grasses comprise the majority of the sward composition (60-90%), with false oat grass, cocksfoot and Yorkshire fog *Holcus lanatus* being the most abundant species. Creeping *Agrostis stolonifera* and common bent *A. capillaris*, red fescue *Festuca rubra*, crested dog's tail *Cynosurus cristatus*, meadow foxtail *Alopecurus pratensis*, and smaller cats tail grasses *Phleum bertolonlii* are also present patchily. Various notable herb's present included, (in order of frequency) wild carrot *Daucus carota*, ribwort plantain *Plantago lanceolata*, red clover *Trifolium pratense*, common knapweed *Centaurea nigra*, agrimony *Agrimonia eupatoria*, common sorrel *Rumex acetosa*, *et alia*.
Bernard's Heath	0.80km	South	An old secondary broadleaf woodland developed on former common land that contains several former sand pits. The woodland is bisected by a road and dominated by ash, with frequent sycamore and oak. Elder, hawthorn and bramble *Rubus fruticosus agg.* comprise the understorey. Woodland indicator species are present in the ground flora such as bluebell, wood meadowgrass, yellow archangel and wood melick. Clearings to the south support managed rough improved amenity grassland, with scattered trees.

Pismire Spring	0.90km	Northwest	Ancient woodland comprised of semi-natural pedunculate oak and hornbeam coppice-with-standards, with other structural trees including wild cherry and ash. The ground flora is dominated by bluebell, with some wood melick, pignut, and yellow archangel. At the northwest are several chalk pits comprising largely hawthorn, hazel and elder scrub, with dog's mercury dominant in the ground flora.
Pudler's Wood	0.96km	Northwest	Ancient woodland comprised of semi-natural pedunculate oak and hornbeam, with dense hornbeam coppice. Ash is locally frequent, with occasional mature pedunculate oak and common lime *Tilia x europaea*, as well as areas of dense elder scrub. The ground flora is dominated by bluebell, with frequent dog's mercury. Other indicator species present include pignut, broad buckler-fern, wood millet, yellow archangel and giant fescue *Festuca gigantea*.

Protected species

Badger

6.52 The woodland habitats provide a larger occurrence of prey items, such as earthworms, which are reduced in more arable field dependant on management practices and chemical use. The boundary hedgerows provide corridors of movement towards offsite woodland, but there are road networks that can hamper movement.

6.53 Multiple records of badgers were identified within desk study research, to the west and north east, with the closest record being a dead badger identified on Harpenden Road approximately 130m from the application site boundary. Notably a number of sett records have been identified across the Heartwood Forest complex approximately 750m north west of the application site.

6.54 Signs of badger were initially recorded on site on 28th August 2018 and during update surveys throughout 2019 and 2020.; field signs included small latrines, squeezes through vegetation and badger hair evidence, as well as the identification of an actively used subsidiary sett (S1) within the mixed woodland compartment W2 and a further three outlier setts (S2-S4), along hedgerow H4 and H5 in the south west, in partial use. A small outlier (S5) was also identified under bramble scrub on the northern edge of the Longspring Wood LWS (W4).

6.55 Update surveys on 8th April 2022 recorded no evidence of badger across the site, with all the setts being reclassified to disused status, due to the significant degree of leaf litter and overgrowing vegetation across the entrance.

6.56 The latest update survey completed on 22nd April 2024 has confirmed limited activity levels across the site, with recently used small latrines being recorded across the application site. Furthermore, setts S1-4 were recorded as partially active, with a single hole entrances being cleared, which would suggest that badgers have visited, but are not in full time occupation

Bats

6.57 The application site can be characterised by the dominance of arable cropland, with a small amenity field associated with Woollam Playing Fields. The remaining habitats are restricted to the perimeters including Longspring Wood LWS ancient woodland, immature broadleaved plantation woodland, a mixed woodland and a network of hedgerows supporting mature trees occasionally along their lengths, with narrow margins.

6.58 The wider environment is largely dominated by urban environs to the south, while north comprises further arable land with small woodland compartments interspersed throughout. Bordering the east and west is the Harpenden Road (A1081) and the railway line respectively, with further woodland to the east and the Heartwood Forest to the north-west.

6.59 A total of 21 mature trees were identified on the site, with seven trees supporting individual preliminary roost features and 14 with preliminary features for multiple roosting bats. These are Important Ecological Features of Local Importance. The location of these trees was compared to the Landscape Framework Plan, whereby it was assessed that no trees with potential will be lost and no further surveys were required at this stage.

6.60 The bat assemblages largely comprised common and widespread species, with common pipistrelle accounting for most of the 2022 static detector survey registrations (91.88%). Soprano pipistrelle (6.1%), brown long eared (0.91%) and noctule (0.53%) were the next most frequent species. Barbastelle bats calls made up 0.2% of the recordings during static detector surveys. This Annex II species is a woodland species that can travel long distances to forage (up to 20km) and the recordings of this species have been along the young woodland plantation belt (W3) and hedgerow H4 during the 2022 survey effort and along hedgerow H2, woodland W2 and the Longspring Wood LWS (W5) in 2024 survey effort. It is considered likely that this species is utilising the hedgerow and woodland edges on site as

commuting habitats potentially between larger woodland foraging/breeding habitats in the wider landscape, such as the Heartwood complex to the north-west.

Birds

6.61 The habitats on site were considered suitable to urban fringe and farmland bird assemblages, with the hedgerows, woodlands, trees and arable margins providing foraging and nesting opportunities for a range of bird species.

6.62 A large number of bird records were received during the desk study, with the majority of these records near and within Heartwood Forest and Langley Wood LWS north west of the site. These records included bird species typical of farmland and woodland habitats.

6.63 A total of 31 bird species were recorded during the breeding bird surveys, including 13 species that are included on one or more of the following categories, (1) Schedule 1 of the Wildlife & Countryside Act 1981 (as amended), (2) BoCC Red or Amber lists; (3) Section 41 of the NERC Act 2006. Hereinafter these are referred to as 'notable species'.

6.64 Of the 31 species recorded, five species were confirmed as breeding while a further ten were considered probable breeders, and the remainder were considered possible or non-breeders. Dunnock *Prunella modularis* were the only notable species recorded as confirmed breeders, with the remaining species being BoCC Green listed (low conservation value). While out of the probable breeders, skylark *Alauda arvensis* (estimated 15 breeding pairs), woodpigeon *Columba palumbus*, wren *Trogolodytes trogolodytes*, whitethroat *Curruca communis* and yellowhammer *Emberiza citrinella*, with the remaining species of low conservation concern. The remaining 16 species were all considered to be possible breeders, including notable species linnet *Linaria cannabina*, yellow wagtail *Motacilla flava*, house sparrow *Passer domesticus*, mistle thrush *Turdus viscivorus*, song thrush *Turdus philomelos*, starling *Sturnus vulgaris* and red kite *Milvus milvus*. Hedgerows, woodland and arable margins across the site provide suitable breeding and/or foraging habitat for an assemblage of common and widespread generalist species.

6.65 During the wintering bird surveys, the majority of bird species recorded were typical of the range of habitats present. The internal parts of the arable fields provided foraging opportunities for a variety of species including skylark, redwing *Turdus iliacus*, song thrush and woodpigeon. Small groups of thrushes were recorded on every survey occasion, either within the arable fields or the surrounding hedgerow/woodland habitat.

6.66 Some species were recorded flying over the Application site only, including black-headed gull *Chroicocephalus ridibundus*, grey heron *Ardea cinerea* and ring-necked parakeet *Psittacula krameri*.

Farmland bird assemblage – off site compensation fields

6.67 As detailed above and within the separate Appendix 6.4, the site supported a range of farmland bird species notably possible breeding skylarks, a declining farmland species that was recorded in moderate numbers, and yellow wagtail, recorded in low numbers. Due to the arable fields supporting possible breeding, additional fields to the north of the Application site were surveyed, with the emphasis of providing compensatory habitats for species displaced during construction.

6.68 The compensatory fields are approximately 49ha in size, located 400m north of the application site. These fields are under the same land ownership and agricultural management, supporting cereal crops during the time of survey. They are therefore considered suitable to provide mitigation for these farmland bird assemblages.

6.69 A total of 30 species were recorded across the proposed mitigation fields, six were confirmed as breeding including a single notable species, yellowhammer, with the remaining five species of low conservation concern. Five species were considered probable breeders, including the notable species wren, song thrush and skylark. The remaining 16 species were considered to be possible breeders (11)

and non-breeders (5). The notable possible breeders were woodpigeon, red kite, willow warbler *Phylloscopus trochilus*, whitethroat, house sparrow, dunnock and greenfinch *Chloris chloris*.

6.70 The bird species recorded were typical of the dominant habitat types, the majority of which is arable land and hedgerows. As with Application site, the internal parts of the arable fields provided breeding opportunities for skylark, with a small number of territories recorded. Other species recorded within field interiors included foraging corvids *Corvidae* and pigeons *Columbidae*.

6.71 A number of species were recorded flying over the fields and were not recorded utilising the habitats during the winter bird surveys. These species included lapwing *Vanellus vanellus*, stock dove *Columba oenas* and herring gull *Larus argentatus*.

Dormouse

6.72 Hazel dormouse surveys were completed in between autumn 2018 and summer 2019, whereby the survey effort score of 22 was achieved exceeding the suggested survey effort score of 20. During the surveys of the site not dormice evidence was found. Desk study research retuned no records for this species within 1lm of the site boundary, and furthermore known populations are sparsely distributed across Hertfordshire.

Reptiles

6.73 The field margins, although narrow (<1m), were assessed as providing some opportunities for reptiles, with consultation results of reptiles recorded approximately 760m north east of the application site, within the Heartwood Forest Complex.

6.74 Surveys conducted in 2018 recorded a single adult common lizard, along the hedgerow H8, which runs alongside woodland W2. Updated surveys in 2022 covered the same areas during which a single common lizard was recorded again along hedgerow H8, resulting in a low population.

Summary

6.75 Based on the surveys undertaken as detailed above and within the species-specific reports in the Appendix, a summary of the IEFs is outlined in Table 18 below. The CIEEM Geographical and Ecological importance scale is used with the Sensitivity scale on which the ES Chapter is being determined by in other disciplines.

Table 18: Summary of Important Ecological Features.

ENVIRONMENTAL RECEPTOR/RESOURCE	SENSITIVITY	GEOGRAPHICAL /ECOLOGICAL IMPORTANCE
Designations		
Chilterns Beechwoods Special Area of Conservation (SAC)	High	International
Longspring Wood Local Wildlife Site (LWS)	Medium	County
Beech Bottom Dyke LWS	Medium	
Kilmart's Spring Wood LWS	Medium	
Langley Wood LWS	Medium	
Batch Wood LWS	Medium	
Jersey Farm Open Space LWS	Medium	
Bernard's Heath LWS	Medium	
Pismire Spring LWS	Medium	
Pudler's Wood LWS	Medium	

ENVIRONMENTAL RECEPTOR/RESOURCE	SENSITIVITY	GEOGRAPHICAL /ECOLOGICAL IMPORTANCE
Habitats		
Broadleaved woodland	Low	Local
Hedgerows	Low	
Protected Species		
Badgers	Low	Local
Bats	Low	
Birds	Low	
Farmland bird assemblage	Low	
Reptiles	Low	

Future baseline or the 'do nothing scenario'

6.76 The baseline scenario described in the previous section was obtained through a combination of desk study and field survey data gathered between 2018 and 2024. It is assumed these conditions will continue owing to the nature of the management of arable land. Whilst there might be some crop rotation, habitat value is likely to remain constant without the proposed development.

6.77 No apparent habitat management regime is currently implemented within the area of broadleaved, plantation, mixed wood or the LWS. The plantation woodland, to the north, contains densely planted species which are likely to outcompete each other, so if these are not monitored then the structure and health of the new woodland will be compromised in the future. Longspring Wood has pockets of scrub, particularly bramble; if no management takes place, then these will increase in density and spread through the wood, which will out compete and overshade the current ground flora, which will cause a deterioration of this habitat.

6.78 Provided the arable management continues the status of protected species on site will likely remain the same or broadly consistent. The exact size and activity levels of the badger sett present in the north of the Application site may be subject to natural variations within the clan and external pressures such as food item availability, although the population and status of badgers is not anticipated to change significantly. It is highly unlikely that the common lizard found is the same individual in 2018 and 2024, however the numbers are likely to be very small and since there was only these sightings, the population will be isolated, and breeding will be limited; where there is not constant inflow of new individuals' genetic diversity will be compromised leading to health impacts from inbreeding. Where there are no changes, the population is likely to be unsustainable and Favourable Conservation Status ("FCS") cannot be maintained.

INHERENT AND STANDARD MITIGATION

6.79 This section describes those 'inherent' and 'standard' mitigation measures embedded within the proposed development which primarily address the scope to avoid, reduce or remedy adverse environmental impacts or enhance the beneficial aspects arising from the construction and operational periods of the proposed development.

6.80 A range of inherent mitigation measures have been identified which will improve biodiversity and connectivity across the local landscape, as well as the FCS of the protected species identified. These comprise the following:

(1) c24.6ha of green infrastructure, constituting 48.6% of the total area. This will provide opportunities for habitat creation, including species-rich meadow grassland, mixed scrub and

woodland habitats. These habitats have been selected through the statutory biodiversity metric to maximise the delivery of on site habitat units and compensate for losses.

(2) Longspring Wood LWS will be protected with 15m buffer for ancient woodland habitat, consistent with standing advice. Additional scrub and woodland planting will expand woodland habitat and management measures will be implemented to promote ancient woodland ground flora.

(3) Retaining, buffering and enhancement of all the existing woodland compartments across the proposals.

(4) Mature trees will be retained, and root protection areas (RPA) will be adequately buffered.

(5) All retained hedgerows will be protected from damage and to allow sufficient room for management in line with RPAs identified in the Arboricultural Impact Assessment (Appendix 6.8).

(6) A SuDS scheme is required for runoff but will provide a green/blue corridor will offer opportunities for habitat creation and increased habitat diversity, although primary function is to provide attenuation.

(7) A hedgerow and species rich grassland footpath corridor to the north-east of the site to provide green corridor to Heartwood Forest.

(8) The development area will include areas of additional tree and introduced scrub planting to maintain biodiversity corridors.

6.81 The green infrastructure throughout the proposals will incorporate a range of habitats including species rich grassland, mixed scrub, woodland, sustainable drainage basins and hedgerows. These proposed habitats have been designed to provide green corridors throughout the development area, connecting existing habitats of higher biodiversity value, such as woodlands and the Longspring Wood LWS, to the wider landscape, notably the Heartwood Forest complex to the north-east. These corridors will provide an enhancement to the existing biodiversity, through providing a range of foraging, nesting and commuting resources within the application site that are currently absent or poorly represented.

6.82 The proposals will retain and enhance a lot of the hedgerow network across the site, with the exception of hedgerow H1 and gaps made across other hedgerows to facilitate access. These hedgerows will be taken out of agricultural management with a minimum 5m buffer provided along hedgerow lengths, ensuring that species rich grassland margins can be created increasing foraging and pollination resource. In addition to this, further native woody species planting will increase hedgerow diversity across its lengths with proposed gaps to be planted up with trees at each end of the hedgerow sections to help improve aerial connectivity. New linear planting will take place in the north east which will create a new habitat corridor to the Heartwood Forest complex.

Non-statutory designated sites

6.83 Longspring Wood LWS will be afforded a 15m buffer from the built proposals, which will be planted up with a mixture of native grassland, mixed scrub and tree planting to create an important corridor for wildlife to utilise the woodland resource and maintain connectivity to the rest of the site and beyond. In addition, a separate management plan for the LWS will be required as a planning condition to ensure that recreational use is restricted to a limited number of footpaths through the woodland compartment, with strategically situated wildlife site information signs and dog bins to minimise nutrient changes to the ground flora and recreational impact on this ancient woodland.

6.84 Proposals include a large area of green infrastructure in the eastern extent of the site, designed with multiple informal and formal footpath routes around the semi-natural greenspace area comprised of mixed scrub, woodland, species rich grassland and SuDS habitats. At the centre of this greenspace, a smaller area of amenity grassland and a Locally Equipped Area of Plan (“LEAP”) will be designed for recreational use. Adjacent to this amenity area will be the main local centre providing facilities for the

local community with the proposed development. Further extension of the footpath network along the north-eastern boundary provides connectivity to the wider area.

Habitat creation and biodiversity net gain

6.85 The proposals have been assessed for their potential to deliver a measurable biodiversity net gain using the statutory biodiversity metric. The calculations have been appended to this ES Chapter (Appendix 6.3) with accompanying figures demonstrating the changes in habitats anticipated.

6.86 A range of habitats will be created to maximise opportunities for biodiversity net gains and enhance the existing resources of habitats present in the local area while also providing suitable habitat for a range of species identified on site and in the surroundings. The following habitats are proposed:

(1) Flowering lawns – The majority of amenity grassland in the scheme will be planted with a diverse flowering lawn mix and will be subject to reduced and rotational management to allow a diverse sward to persist.

(2) Mixed scrub – A range of native scrub species will be planted to ensure no one species dominates. Areas of scrub will be managed with informal edges to allow more diverse edge habitats to develop, and larger blocks of scrub will be managed to allow the establishment of clearings to promote structural diversity.

(3) Broadleaved woodland – Small blocks of broadleaved woodland will be planted with a range of native species and will be managed primarily for its ecological value.

(4) Sustainable Drainage Systems – The underlying free draining geology, dictates that the SuDS features will be designed to hold very little water retention. Therefore, they will be planted with a range of inundated plant adapted to these conditions and species rich grassland.

(5) Species-rich grassland – The proposed greenspaces in the east of the site, will be designed with grassland areas seeded with a species-rich grassland mix. These areas will be managed sympathetically for the ecological value. Moderate will be the target condition for this area.

(6) Allotments and community orchard – The proposed greenspace will include areas for amenity growing, including an orchard supporting a range of native fruit and nut tree species. These will be managed to support biodiversity through appropriate grassland and arboricultural management.

(7) Hedgerows – Retained hedgerows will be brought under a favourable management regime and new hedgerows will be planted using a range of native species.

(8) Urban trees – A range of native and non-native trees will be planted throughout the scheme, including street trees and standards across the proposed green infrastructure. A range of tree species will be planted to provide diversity and select the right tree for its location. All proposed trees are assumed to be small trees as defined by Natural England after 30-years.

6.87 The habitat creation and enhancement measures will result in the changes summarised in Table 19 below. Developments must achieve the minimum statutory 10% gain in units from each type, area habitats, hedgerows and rivers and streams, independently.

Table 19: Biodiversity net gain summary results

UNIT TYPE	CATEGORY OF SIGNIFICANT RESIDUAL EFFECT	BIODIVERSITY UNITS / PERCENTAGE RESULTS
Baseline	Habitat units	108.88
	Hedgerow units	32.80
Post-intervention	Habitat units	121.11
	Hedgerow units	41.44

UNIT TYPE	CATEGORY OF SIGNIFICANT RESIDUAL EFFECT	BIODIVERSITY UNITS / PERCENTAGE RESULTS
Total net unit change	Habitat units	+12.23
	Hedgerow units	+8.65
Total net percentage change	Habitat units	+11.23%
	Hedgerow units	+26.37%

6.88 The site is achieving the statutory 10% gain on site. There are additional rules laid out in the metric, governing the trading of different broad habitat types between the baseline and proposals stages. The unavoidable loss of the small area of priority arable margin in the southern extent of the site, is unfeasible to retain or recreate within the development proposals, resulting in the habitat trading rules are not satisfied. However, the proposals will lead to a significant overall gain in medium distinctiveness habitats, including providing greater habitat diversity across the site

6.89 Further information regarding the green infrastructure proposals is available in biodiversity net gain assessment prepared for the proposals at Appendix 6.3.

Fauna

Badgers

6.90 The retained linear features and woodland compartments, where the partially used setts re currently situated, will be enhanced through additional planting of native species of shrubs and trees bearing berries, fruit and nuts such as cultivars of cherry, apple and plum which will act as a screen and foraging resource, if the setts become occupied. These foraging resources will be supported through the creation of proposed species rich grassland which will provide good conditions for earthworms which make up a large proportion of the badger diet. Further creation of mixed scrub, woodland and hedgerows will provide greater connectivity with the existing the habitats on site. Buffering of the existing and newly created habitats will create darker corridors for these species to commute around the proposed development across the wider landscape.

Bats

6.91 Linear features will largely be retained, with root protection areas and enhanced through additional planting creating structural diversity on the edges. Creation of new hedgerows will provide additional navigational and foraging routes. Retaining and buffering the existing woodland features will incorporate darker corridors ensuring continued use by the local bat population, which will especially benefit the light sensitive bats, such as barbastelle.

Birds

6.92 Existing hedgerows will be enhanced through the planting of additional native species, with preference given to indigenous species, in particular those that are seed and fruit bearing, which tend to support a greater diversity and number of invertebrate species for birds to feed on. Additional mixed scrub, species rich grassland, woodland and tree planting will provide a greater diversity of habitats on site for bird species, providing a range of different foraging and nesting resources.

Farmland birds

6.93 The proposed creation of mixed scrub and species rich grassland habitats nearby to offsite the loss of arable landscape will provide nesting and foraging resources for more generalist farmland bird species such as Linnet. However, it is considered that more specific mitigation will be required for specialist farmland bird species, such as skylark, which ground nest in arable margins.

Reptiles

6.94 Common lizard was identified in low populations which were localised to the northern boundary of the site. The creation of species rich grassland and hedgerows will provide corridors for commuting and foraging around the edge of the proposals. Larger areas of species rich grassland, mixed scrub and SuDS features in the eastern extent of the site could potentially increase opportunities for this species to expand throughout the site, and potentially create new colonisation opportunities from the surroundings, thus increasing breeding potential and turn increase FCS.

Standard mitigation

Construction phase - Construction Environmental Management Plan

6.95 As is common-place, a CEMP will be prepared to regulate construction activities and their effects on IEFs. The CEMP will specify measures to protect environmental features from harmful effects that could otherwise arise during the construction phase by adopting best working practices and avoidance strategies.

6.96 The CEMP will apply the most recent ecological baseline to inform mitigation, the appropriate location and timing of works, the responsibilities of site workers, and the use of barriers or signage. Where required, an Ecological Clerk of Works ("ECoW") will be present to give tool box talks and walk through the IEFs present to ensure that measures needed to avoid effects with regard to specific legislative and policy protection are adhered too.

6.97 The CEMP will detail, amongst other things:

(1) appropriate buffering locations/widths around key retained habitats (i.e. woodland, trees and hedgerows);

(2) dust mitigation measures;

(3) fuel and chemical spillages management, through Pollution Prevention Guidance;

(4) schedule 9 WCA invasive species removal and monitoring, notably for Virginia Creeper identified in mixed woodland W2 compartment; and

(5) specific method statements for legally protected and notable species (badgers, bats, nesting birds, reptiles, and other NERC Section 41 species that might be encountered.

6.98 As is usual practice, the preparation and approval of the CEMP will be secured by planning condition.

Non-statutory designated sites

6.99 The possibility of fuel and other chemical spillages during construction will be minimised through effective and rigorous site management including a contingency plan should an accident occur. Any environmentally hazardous material used will be kept in dedicated stores and storage tanks will have appropriate bunding and following Pollution Prevention Guidance; which will all be detailed in the CEMP. Such measures are important near woodland but particularly Longspring Wood LWS/ancient woodland.

6.100 Fencing will be erected around the ancient woodland/LWS these will note the Root Protection Areas ("RPA") an ensure that no accidental encroachment or storage of materials/site compounds takes place.

Habitats

6.101 Mitigation measures will ensure that all retained habitats are afforded suitable protection throughout the construction period. All construction works taking place in the vicinity of retained trees, woodland

and hedgerows will have enforced with fencing prior to site works; this will avoid accidental damage via machinery access, storage of materials and site compound positioning.

6.102 Where public footpaths and roads are to be constructed within RPAs, these will be constructed using a 'no dig method of construction' according to arboricultural best practice, utilising soft materials that will allow gaseous diffusion through root systems. If such methods cannot be used, load spreading, and tree root friendly construction will be adopted.

Fauna

Badgers

6.103 Activity has been sporadic but none of the badger setts are thought to be currently full time occupied, but badger activity has been recorded through the site. Updated badger surveys will need to be conducted at reserve matters to confirm there have not been any changes; if badger setts become occupied then further mitigation maybe required including a Natural England licence for closure if they are in locations where they will be lost.

Bats

6.104 The location of site offices, construction compounds and storage will be sensibly chosen in areas away from habitats utilised by bats in order to mitigate for the potential disturbance effects of artificial construction lighting on bat behaviours. Wherever possible, construction activities will be undertaken during daylight hours where possible, during periods of bat activity (March to November). If lighting is required then this will avoid natural habitats, via directional lighting or shrouded.

Birds

6.105 All construction activities requiring the removal of vegetation will occur outside of the bird breeding season (March to mid-August/September inclusive). Where this is not possible all vegetation should be checked by a qualified ecologist before any removal takes place. This is a statutory requirement owing to the protection of all birds on the nests under the Wildlife and Countryside Act 1981 (as amended). Retained habitats such as hedgerows and tree groups, will have protective fencing erected to ensure there is no accidental encroachment of machinery or materials takes place could disturb / damage nests.

6.106 Evidence of skylarks is associated with the site's arable fields. If construction works are due to take place in spring/summer, then these habitats will need to have been removed before the breeding season. If this is not possible, the habitat removal will need to undertake with ecological supervision.

Reptiles

6.107 Where small losses to field margins need to occur for construction, precautionary measures will be implemented to ensure that any reptiles in such areas are not harmed. This will involve the passive displacement of possible individuals via habitat manipulation towards areas of retain habitats to the north and/or west. The proposals will include a variety of habitat mosaics to be created around the site, particularly in the central areas these will have a benefit on the reptile population, if additional numbers were to colonise in the future.

Operational Phase

Ecology Management Plan

6.108 All areas of green infrastructure will be managed in the long term under an agreed management strategy, which will maximise the biodiversity by detailing management prescriptions relative to habitat type, species requirements and specific mitigation measures. An Ecology Management Plan ("EMP") or similar will be produced pursuant to a planning condition, when the final detailed design of proposed development can be confirmed.

6.109 A range of proposed habitats will be created including woodland, hedgerows, species rich grassland, individual trees, mixed scrub and SuDS features. These habitats will be created using native species that are provide nut and fruit resources but also provide a density planting to enable linkage corridors to be created where previous habitat have been lost or not provided. Seed mixes and individual tree/shrubs will ideally be sourced locally and from stocks of local provenance in order to improve their resilience to local environmental changes.

6.110 The mixed and broadleaved woodland compartments in the northern extent of the site will be managed appropriately to enhance their intrinsic ecological value, as well as the creation of a diverse range of native mixed scrub and woodland habitats to support these features. These woodlands will be fenced off from the public through the installation of a wildlife friendly fenced and additional thorny scrub planting. It is therefore considered they are unlikely to receive recreational pressures impacting them and will be managed as important green corridors for wildlife.

6.111 The retained hedgerows will be appropriately buffered from the proposed development area, with additional native woody species planting used to enhance the biodiversity value of these corridors. Furthermore, proposed gaps will be planted up at each end of the hedgerow section to help improve aerial connectivity. Mature trees along identified along the lengths of the hedgerow will be protected with individual buffers according to their specific root protection zones.

6.112 Homeowner information packs will be provided to each resident; these will detail the importance of the habitats created within the GI and how they are utilised by species. The pack will also raise awareness of the wider environment outside of the Application site, including best practice behaviours to avoid damaging sensitive areas this including the LWS/ancient woodland.

6.113 Dog waste and litter bins will be provided as part of the proposals, that are strategically located near GI areas and LEAPs and will be regularly emptied. Residents with cats will be encouraged to keep cats inside during the evenings and if they are released that cat collars with bells are worn.

6.114 All habitats, whether retained, created or subject to enhancement, will be monitored in the long term to ensure future sustainability, viability and that they remain suitable for the intended purpose (when provided as specific mitigation measures). Assessments of habitats will be undertaken by an experienced ecologist and/or landscape contractor with experience in managing such habitats. Non-viable or failed specimens/habitats will be replaced on a like for like basis or with similar. Non-target species will also be managed to ensure that they do not outcompete to desired species.

6.115 Details regarding the removal and continued monitoring and management of invasive species (as defined under Schedule 9 of wildlife and Countryside Act 1981 (as amended)) identified on site, notably Virginia creeper to ensure they do not re-establish.

Fauna

6.116 The above homeowners information pack will provide general details on the protected and notable species that are present within the application site, and what measures have been provided within the scheme. This will raise awareness and identify the sensitively of key areas of the application site so to avoid disturbance.

Badgers

6.117 Monitoring of the setts and the habitats that surround them, will ensure that if setts are active that there is enough screening and protection from inquisitive members of the public and their dogs. Management measures will ensure that the shrub/scrub planting maintained a barrier from the public but safe passage for badgers, if present.

6.118 This section includes the identification and assessment of the nature, extent and magnitude of change that the proposed development will have on IEFs. By employing the sensitivity of the receptor and magnitude of change, the significance of environmental effects (including any, direct or indirect effects), which arise as a result of the construction and operational periods of the proposed development will be determined. This assessment will consider inherent and standard mitigation described in the preceding section.

Construction Phase

Statutory / Non – statutory Designated Sites

6.119 It is considered that the intervening distance will eliminate the direct and indirect impacts of the construction stage on the Chilterns Beechwood SAC whereby there will be no effects.

6.120 The majority of the LWSs support secondary and ancient woodland habitats, with the exception of the Jersey Farm Open Space LWS. The main threats to these habitats include climate change, inappropriate development, pollution, growing population and urban environments, as well as tree pests and diseases. It is considered that the majority of these LWSs are a sufficient distance from the proposals, that there will be no direct and indirect impacts during the construction phase. The exception to this is the on site Longspring Wood LWS, and the Beech Bottom Dyke located 0.27km south, which, with the provision of the inherent and standard mitigations above, means that effects will be negligible negative.

Habitats

6.121 The biodiversity net gain assessment has shown that the 10% statutory guidance can be achieved through the appropriate retainment and buffering of the woodland compartments across the site.

6.122 Hedgerow H1 will be lost in its entirety, while minor gaps will be made through H2, H4-H6 and H9-H11 to facilitate access for road and public footpath infrastructure. The loss of these linear features will impact the BNG negatively, but also affect the connectivity as some limited points on site. It is therefore considered that there will be a minor short term negative direct effect at local level.

Protected species

Badgers

6.123 Badger setts within the mixed woodland to the north will be retained within the proposals, and current surveys suggest that these are not consistently occupied. The GI habitats adequately buffer these setts should they become occupied in the future. It is therefore considered that S1 will be adequately buffered from the proposed development in the northern extent of the site, where they will be negligible negative effects to the sett.

6.124 Setts S2 -S4 will be retained and buffered during the construction of the current proposed housing and associated road infrastructure. The up-to-date survey information suggests that badgers are using the site infrequently and that these setts are also not continuously active, so currently the effects on the badgers directly from construction is also negligible, whereby the conservation status of the badger clans will not be affected.

Bats

6.125 The proposals include the loss of habitat types of limited value and low suitability to bat species, including arable land. Areas of more suitable habitats to be lost include sections of the hedgerows, which are provide commuting resources for largely common bat species. The habitat losses associated with construction operations are limited and the buffering and habitat creation will

provide alternative routes and foraging opportunities. The loss of small stretches of hedgerows are likely to have a minor negative temporary short term indirect effect at a site level.

6.126 Bat behaviours can be affected by lighting, dependent on the species and extent of the lighting, although most of the construction activity will occur in daylight hours reducing that effect. Where daylight hours are reduced during the autumn/winter months, bats will be starting to go into hibernation; however, there is potential during the intermittent period that if construction lighting is needed this could affect foraging and navigational routes. This would have a minor negative temporary short term direct effect at site level.

Birds

6.127 The proposals are largely restricted to areas of arable habitats that are of limited suitability, whereby the majority of the species recorded were generalist species. The losses of arable habitats may result in short-term losses in the overall availability of foraging habitat for this generalist assemblage, but it is considered that these habitats will be present in the landscape immediately adjacent to the north. It is therefore considered that the construction phase will result in a minor negative temporary direct short-term effect at local level on the generalist bird assemblages identified on site.

Farmland birds

6.128 The losses of arable habitat will lead to an overall reduction in the availability of suitable breeding and foraging habitat for farmland birds, such as skylark. This is not considered to be a significant impact outside the designation of protected sites (SSSI, SPA etc).

6.129 The removal of arable land will remove opportunities for potential breeding habitat that are unlikely to be provided within the GI, as areas are likely to be subject to disturbance as they are frequented by the new residents of the proposed development. The surveys had recorded 10 probable breeders and 16 possible breeders. Therefore, as arable habitats are not to be created within the scheme there is likely to be a minor/moderate negative permanent direct long-term impact at a local level on the farmland assemblages.

Reptiles

6.130 Surveys undertaken in 2018 and 2022 recorded a single common lizard on 1 survey occasion each year, along hedgerow H8 above mitigation measures identified in the preceding section are intended to ensure that there are no offences committed with regards to where this single lizard has been recorded, and as the numbers are so low it is likely that the population is not sustainable. The green infrastructure will provide alternative areas of more optimal use due to the diversity of habitat types that could sustain and increase the favourable conservation status of this species if further colonisation and breeding takes place. Providing habitats mature and are maintained these measures can lead a minor positive permanent direct long-term effect at a local level.

Operational phase

Statutory / non-statutory designated sites

6.131 The proposals are located beyond the 12.6km zone of influence for this designated area and it is therefore considered that there will be no significant direct or indirect impacts from the development proposals.

6.132 The mitigation measures outlined above will ensure that the integrity of the LWSs are maintained through the provision alternative areas of recreation that are provided through the scheme. Longspring Wood on the southern boundary links to a public footpath that goes west towards Bernards Heath or north east along the railway line and ends at Sandridgebury Lane; it is possible that once residents are in occupation that possible short cuts through the ancient woodland of the LWS will be created to access this pathway, thus directly impacting the ground flora and eroding structural

diversity within it. This is likely to have a minor/moderate negative temporary/permanent direct long-term impact at a county level.

6.133 The green infrastructure includes a large area of public amenity greenspace surrounded by a mixture of semi-natural habitats including species rich grassland, mixed scrub, woodland, SuDS, and individual tree planting. A circular network of formal and informal footpaths around this green infrastructure will provide recreational space with areas of off lead exercise space for dogs. Notable features to the footpath network is the proximity to the proposed local centre, as well as an extension of the public footpath along the north-eastern boundary, along the railway line connecting to the Heartwood Forest. This national forest provides 347ha of natural greenspace, including wild meadows, community orchards and broadleaved woodland, with well-connected footpaths, signposts, dog bins and car parking. It is therefore considered that the proposed green infrastructure will support the existing greenspace features within the landscape, providing appropriate recreational areas to further mitigate the impact on the local wildlife sites in the local surrounding area.

6.134 The green infrastructure creation throughout the proposals is expected to mitigate the recreational impact to the local wildlife sites. It is therefore considered that with the creation of the green infrastructure, there will be a negligible negative impact on these designated sites.

Habitats

6.135 The removal of arable land will create a significant opportunity to increase the number of beneficial habitats, which will include species rich grassland, woodland, mixed scrub, SuDS, urban trees and hedgerows. The removal of intensively managed arable habitats will therefore have a moderate positive long-term direct effect at a local level.

6.136 The green infrastructure has been designed with the implementation of the statutory biodiversity net gain metric at an early stage to maximise the biodiversity potential and value throughout the site. Therefore, the proposals will incorporate a range of new habitats including species rich grasslands, mixed scrub, woodland, SuDS features and tree planting to further enhancing the biodiversity value on site. Additional native species hedgerows will be proposed throughout the urban and green infrastructure areas, to improve connectivity, woody species diversity and pollination resources throughout the site.

Hedgerows

6.137 Compensation planting using native species will be undertaken as part of scheme GI proposals and management measures implemented within the CEMP and EMP will ensure these new habitats maintain their value. These measures will ensure that there is a minor long term positive permanent long term direct effect at a local level.

Woodland

6.138 There is potential that as the on site woodlands start to mature and management regimes are in place through the CEMP and EMPs, whereby their conservation value starts to increase. However, as occupation takes place activity around the site will increase which could cause degradation of these areas through recreational pressure from extended play by children and possible short cuts through such features. It is therefore expected that there will be a minor/moderate negative temporary/permanent long-term impacts at local level.

Fauna

Badgers

6.139 Proposals will result in a large area of residential development, potentially increasing disturbance if badgers do frequent the site once completed, as they will look for easily accessible food items. Due to the increases in residential dwellings there might be more conflicts with badgers from household

pets and also increases in possible road collision. Measures will be provided to ensure badgers cannot interfere with bins and the site will have measures in place to ensure that car speeds are limited, thus ensuring impacts are negligible**.**

Bats

6.140 Proposals will increase light levels through the introduction of building and street lighting, which would reduce the suitability of retained/created hedgerows and habitats. However, the implementation of the lighting strategy, as detailed above, will reduce the scale of these impacts to a negligible negative effect.

6.141 The retention and buffering of the hedgerows and woodland habitats around the peripheries, including the Longspring Wood LWS, will continue to provide suitable commuting habitat across the site and will maintain wildlife corridors to the wider landscape.

6.142 The creation of diverse greenspaces spaces around the Application site, and in particular to the east, will provide greater diversity for invertebrate species and thus improved foraging opportunities for bat species when compared to the baseline habitats present. This will include native species-rich grassland, mixed scrub, woodland and SuDS features that will provide opportunities for invertebrate prey species. Further connection to existing woodlands and hedgerows in the wider area, thus provide an overall increase in natural foraging and roosting opportunities for bats in the long-term.

6.143 The operational effects of the proposals will therefore result in a minor positive long term permanent direct positive effect at local level on the local bat populations due to the overall increase in the availability of suitable foraging and navigational sensitive habitats.

Breeding birds

6.144 The retention of the woodland and the majority of the hedgerows throughout the proposals will continue to provide habitats for the majority of the bird species recorded. This habitat diversity will be further increased throughout the proposals with diverse range of habitats as part of GI that provide additional foraging and breeding opportunities for the generalist and woodland edge species that comprised the majority of the species recorded on site. As gardens mature, this will also provide additional opportunities for a number of the species recorded that will readily habituate to human disturbance, including greenfinch, song thrush, dunnock, starling and house sparrow. These will have a minor positive long term indirect impact at local level.

6.145 The increase in domestic animals during the operational phase, particularly cats, may lead to an effect on small bird populations. However, it is considered unlikely that the increased abundance of cats would alter the conservation status of any of the breeding bird assemblages present in this instance, with the magnitude of any such impact reduced by the retention, enhancement and creation of hedgerows and mixed scrub which will continue to provide cover and screening from potential predators. It is therefore considered that the impact of cats will be negligible negative.

Farmland Birds

6.146 The farmland bird species utilising the site are likely to be most affected by the development due to the total loss of arable habitat that will not be mitigated for within the Application site. Linnet may benefit from the GI proposals in the east through the inclusion of native-species rich grassland and habitat mosaics, promoting foraging and nesting opportunities. Other farmland species, including skylark and yellowhammer, are likely to be lost due to the removal of arable land. It is considered that the proposals will result in a moderate negative permanent direct long term impact at local level on the local farmland bird assemblages.

Reptiles

6.147 The surveys indicate that there is a low common lizard population, restricted to the woodland buffer on the north-eastern boundary of the site. The proposals will include the retention and buffering of

this particular woodland compartment, as well as other suitable habitats across the site including hedgerows and woodlands.

6.148 The proposals will see the creation of a diverse range of habitats including species rich grassland and SuDS areas providing foraging opportunities, as well as mixed scrub, hedgerows and woodland which will provide areas for commuting, refuge and hibernation. It is expected that, overall, this will provide an increase in suitable habitats from the existing arable land. Therefore, it is expected that the proposals will lead to a negligible positive effect to the local reptile populations.

6.149 Table 20 below summarises the magnitude of change that the important ecological features will experience.

Table 20: Summary of magnitude of change across identified Important Ecological Features.

ENVIRONMENTAL RECEPTOR/RESOURCE	MAGNITUDE OF CHANGE
Chilterns Beechwoods Special Area of Conservation (SAC)	No effect
Longspring Wood Local Wildlife Site (LWS)	Low / medium negative
Beech Bottom Dyke LWS	Negligible
Kilmart's Spring Wood LWS	
Langley Wood LWS	
Batch Wood LWS	
Jersey Farm Open Space	
Bernard's Heath LWS	
Pismire Spring LWS	
Pudler's Wood LWS	
Habitats	
Broadleaved Woodland	Low negative
Hedgerows	Low negative
Protected Species	
Badgers	Negligible
Bats	Low negative effect
Birds	Low negative effect
Farmland bird assemblage	Medium negative effect
Reptiles	Negligible

6.150 Table 21 below summarises the significance of effect, assessed through the combination of the Environmental Receptor sensitivity and magnitude of effect.

Table 21: Summary of significance of effect on Important Ecological Features

ENVIRONMENTAL RECEPTOR/RESOURCE	SENSITIVITY	MAGNITUDE OF CHANGE	SIGNIFICANCE OF EFFECT
Chilterns Beechwoods Special Area of Conservation (SAC)	High	None	No effect/ effect
Longspring Wood Local Wildlife Site (LWS)	Medium	Low / medium	Minor / moderate effect
Beech Bottom Dyke LWS	Medium	Negligible	Negligible effect
Kilmart's Spring Wood LWS			
Langley Wood LWS			
Batch Wood LWS			
Jersey Farm Open Space			
Bernard's Heath LWS			
Pismire Spring LWS			
Pudler's Wood LWS			
Habitats			
Broadleaved Woodland	Low	Low	Negligible effect
Hedgerows	Low	Low	Negligible effect
Protected Species			
Badgers	Low	Low	Negligible effect
Bats	Low	Low	Negligible effect
Birds	Low	Low	Negligible effect
Farmland Bird Assemblage	Low	Minor	Minor effect
Reptiles	Low	Negligible	Negligible effect

ACTIONABLE MITIGATION

6.151 Following the review of the likely effects on the environmental receptors, actionable specific mitigation will be undertaken in order to reduce the impact on these receptors which result after inherent and standard mitigation measures have been implemented.

Badgers

6.152 Badger setts are sporadically used, but surveys will be updated to ensure they are relevant during future applications; but it is also recommended that surveys are done before commencement of construction as a precautionary measure.

6.153 The green infrastructure proposals will result in a greater diversity of habitats, including species diverse grassland which will improve invertebrate availability, as well as native trees and shrub planting, bearing fruits, nuts and seeds which will improve the foraging resources available to this species on site.

Bats

6.154 The retention of boundary trees, scrub and hedgerows along with the creation of new linear features will ensure connectivity is maintained, enhanced and strengthen. The site has been designed to include a biodiverse core with species diverse green space along Sandridgebury Lane and within the centre from north to south, ensuring linkages around and through the site.

6.155 Due to the presence of light-sensitive species, including barbastelle and long-eared bat species, a sensitive lighting scheme will be designed into the proposals. Measures include those within the best practice guidance[13,14], including:

(1) The avoidance of direct lighting and light spillage on nearby GI using directional lighting.

(2) The use of low-pressure sodium lights, which emit one light wavelength and attract less insects.

(3) Restricting the height of light columns to reduce horizontal spill.

(4) Installing low wattage LED security lighting on properties close to GI during construction to avoid future homeowners installing unsuitable lighting for bats.

(5) Lights on buildings placed on timers to ensure periods of darkness.

(6) Car parks and pathways will have low level downward-facing lighting and, depending on the design, rear light baffles or cowls added to direct light.

6.156 If proposals change and bat roost potential trees are to be impacted by the development, either directly or indirectly, then further surveys will be required.

6.157 Bat boxes will be installed on mature trees around the site to enhance roosting opportunities. These will include woodcrete boxes, such as Schwegler 1F, 2FN or similar designs for trees, as well as bat tubes incorporated into the brickwork of new buildings close to known commuting habitat, such as the unrendered Habitat 001 bat box.

Birds

6.158 Nesting opportunities for breeding birds will be enhanced through the installation of bird boxes. The provision of such enhancements would be in accordance with local and national planning policy. The following provides details of suitable nest box types to be included within the scheme:

(1) A mixture of small hole (26mm and 32mm) boxes placed throughout the Application site on suitable trees and buildings will provide nesting opportunities for blue tit *Cyanistes caeruleus* and great tit *Parus major*. These boxes generally have a high uptake rate;

(2) Larger nest boxes with a 45mm hole should be placed under the eaves of buildings, or approximately 2.5m above ground in trees in order to provide nesting opportunities for starling; and larger terraced style or multiple single holed 32mm nest boxes should be placed on buildings to attract house sparrows *Passer domesticus;*

(3) Small open fronted nest boxes again should be placed throughout the Application site especially on trees which support a climber such as ivy Hedera helix which provides a degree of concealment. These boxes typically attract robin *Erithacus rubecula*, blackbird *Turdus merula* and spotted flycatcher *Muscicapa striata;*

(4) A mixture of more specialised nest boxes should be placed on retained trees and new buildings and should include boxes for stock dove Columba oenas, kestrel Falco tinnunculus, swallow Hirundo rustica, and swift Apus apus.

6.159 The condition of the boxes should also be monitored, and where they are starting to fail, they are replaced prior to the breeding season.

Farmland birds

6.160 During the early bird surveys it became apparent that the farmland assemblages might be a constraint to the development, and owing to the removal of all arable land and the creation of habitat

[13] Bat Conservation Trust (2018) Guidance Note 08/18 – Bats and artificial lighting in the UK. BCT, London.
[14] Institute of Lighting Professionals (2021) Guidance Note 01/21 - The Reduction of Obtrusive Light. ILP, Warwickshire.

that may not fully compensate for the losses, FPCR undertook an assessment of compensatory arable fields consisting of approximately 49.1ha located north of the development (Figure 6.4). This land is under the same land ownership as the application site, and is currently being managed as agricultural land. It is expected that the creation and management of the mitigation plots will be secure through an appropriate legal agreement.

6.161 In accordance with the guidance for skylarks, based upon the estimated 15 breeding pairs on site, these mitigation fields will be used to create ten plots, following the guidance detailed below;

(1) Each plot to be a minimum of 4m x 4m in size;

(2) Incorporated within a suitably sized (field area in excess of 5ha with an open aspect, or in excess of 10ha if bound by trees or adjacent woodlands) arable parcel of land;

(3) Placed at a minimum density of two plots per hectare within fields containing winter cereal;

(4) Positioned at least 50m from field boundaries and margins, and between tramlines wherever possible;

(5) Located within fields where skylarks are present or have been in the past.

6.162 Plots are to be created by either turning off the drill during sowing to leave an unsown plot; or sowing the crop as normal and spraying with herbicide to create the plot by 31 December.

6.163 These plots will be delivered within the existing rotational agricultural management and will be further monitored between mid-April and mid-May to assess their progress. It is expected that these mitigation areas will provide and enhancement to the baseline arable habitats, providing increase availability for nesting and foraging potential within the landscape. These areas will further be supported by the abundance of arable land across this landscape.

Reptiles

6.164 The construction of hibernacula within suitable areas of the green infrastructure would enhance these habitats through providing additional refuge and basking areas for a range of reptile species. Where possible these features should be constructed utilising deadwood, brash and earth features from typical management on site.

Operational

Non-statutory designated sites

6.165 It is considered that the incorporation of the Longspring Wood LWS into the proposals, will enhance the woodland in the long term, through the implementation of a management plan, including restricting public access to a footpath, to promote the growth of the ancient woodland ground flora.

Habitats

6.166 The existing and proposed habitats will be incorporated into a 30 year detailed a EMP or similar, providing details of management, as well as a monitoring programme to ensure that these habitats reach their target conditions, achieving the overall biodiversity net gain on site. This will include the monitoring of vegetation and ensuring they establish and thrive, where they do not or are damaged then a review of the replacements will be undertaken and use native alternative if possible or species that are tolerate of the pressure identified i.e. drought tolerance. Monitoring will also ensure waterbodies do not get dominated by one species such as Phragmites and allow for the micro-climates needed for invertebrates and amphibians.

RESIDUAL EFFECTS

6.167 Following the implementation of the actionable mitigation measures detailed above, the residual effects on the identified IEFs are considered to be as follows.

Non-statutory designated sites

Operational

6.168 The buffer and subsequent structural planting, along with the information provided on information boards and home seller packs will ensure that the integrity of the LWS is not compromised by the Proposals; whereby the bringing in of an official management regime will secure its value into the future, where there is likely to be a minor/moderate positive permanent direct long terms effect at county level.

Habitats

Construction

6.169 The proposed mitigation measures and CEMP will minimise potential effects from disturbance, incidental damage, pollution, and habitat loss, such that those effects on retained and created habitats will be negligible. Creation of new habitats previously absent, provide diversity within the scheme ensuring moderate positive permanent direct long-term effect at a local level.

Operational

6.170 The establishment of a variety of new habitats and the successful maturity will be dependent on factors including weather, management and utilisation by the public/new residents. The EMP or similar will ensure that the habitats created and enhanced, do establish successfully, and remain viable for the foreseeable future, which will require a 30-year management period as specified as part of the statutory BNG metric. These measures will therefore ensure minor/moderate positive permanent direct long-term effect at a local level.

Fauna

6.171 The EMP or similar will ensure new fauna species can potentially colonise, and the existing species assemblages will greatly benefit from increased foraging and refuge opportunities created including bat and bird boxes, which collectively will positively benefit the FCS of species. This will lead to minor/moderate positive permanent direct long-term effect at site/local level.

6.172 The offsite provisions for farmland birds will provide compensation for the habitat lost within the site, with specific measure to be incorporated that will increase the breeding success owing to the plots created within the arable field, thus increasing bird assemblages within the local area. The management and securement of such land and its management will have a minor/moderate positive permanent direct long terms effect at a local level on the breeding success of farmland birds.

Table 22: Summary of residual effects on Important Ecological Features

ENVIRONMENTAL RECEPTOR/RESOURCE	SIGNIFICANCE OF RESIDUAL EFFECT	GEOGRAPHICAL/ECOLOGICAL IMPORTANCE
Chilterns Beechwoods Special Area of Conservation (SAC)	No effect	International
Longspring Wood Local Wildlife Site (LWS)	Minor positive effect	County
Beech Bottom Dyke LWS	Negligible effect	
Kilmart's Spring Wood LWS	Negligible effect	
Langley Wood LWS	Negligible effect	
Batch Wood LWS	Negligible effect	
Jersey Farm Open Space	Negligible effect	
Bernard's Heath LWS	Negligible effect	

ENVIRONMENTAL RECEPTOR/RESOURCE	SIGNIFICANCE OF RESIDUAL EFFECT	GEOGRAPHICAL/ECOLOGICAL IMPORTANCE
Pismire Spring LWS	Negligible effect	
Pudler's Wood LWS	Negligible effect	
Habitats		
Broadleaved Woodland	Minor positive effect	Local
Hedgerows	Minor positive effect	
Protected species		
Badgers	Negligible to minor positive effect	Local
Bats	Negligible to minor positive effect	
Birds	Minor positive effect	
Farmland bird assemblage	Minor positive effect	
Reptiles	Minor positive effect	

CUMULATIVE EFFECTS

Sewell Park

6.173 The Ecological Report (2020, Turnstone Ecology) prepared for the Sewell Land Trust site has been reviewed to inform this ES chapter. The recommendations of this report do not identify any significant impacts to the ecological receptors surveyed. However, the location of this site in respect of the application site, has the potential for in-combination effects on the local ecological receptors identified.

Designated sites

6.174 Sewell Park proposals provide a range of green infrastructure, including areas of semi natural and amenity greenspace throughout the development area. These areas are expected to offset the majority of the recreational pressure from their own development. However, there is the potential to provide footpath linkages connecting to the local centre and further amenity greenspace proposed in the Application site. It is therefore considered that the in-combination effects of the recreational pressure across both sites are unlikely to significantly increase the impact on the designated sites, notably the Longspring Wood LWS.

Habitats

6.175 The majority of Sewell Park is comprised of semi-improved grassland and mixed scrub, which has been retained in part within their proposed scheme. Due to the contrast in habitats from the Application site, it is not considered that the in-combination effect of the impact of the habitat loss will be significant.

6.176 Potential footpath linkages between Sewell Park and the application site will result in the loss of small sections of hedgerow H4. Where gaps are made through this hedgerow, it is expected that the mitigation measures detailed in the section above can be implemented to mitigate the minor loss of this hedgerow habitat and additional planting within Sewell Park will be created.

6.177 It is concluded that the in-combination effects from both these proposals is unlikely to significantly impact the habitats.

Protected species

6.178 The ecological survey evidence associated with Sewell Park identified protected species constraints for badgers, bats and breeding bird species, which have been mitigated for within their separate proposals. There is no greater cumulative effect therefore.

Badgers

6.179 The Sewell Park proposals involve the loss of potential foraging territory for the local badger clan. Badgers are a highly mobile species which control very large foraging territories, averaging around 50ha in size, but can be as large as 300ha in areas of poor habitats[15]. The habitats found across the both Sewell Park and the Application site represent a large area, albeit limited in foraging potential.

6.180 Setts S2 and S3 are located on hedgerow H4 which adjoins both of the site. These setts are classified as outlier setts which have been sporadically used. The current proposals across both development sites, includes buffers to ensure no direct damage occurs.

6.181 The cumulative effects of the both the proposals will result in a negligible impact for this species at a **local level**.

Bats

6.182 The proposals will result in the loss of minor gaps of hedgerow H4, to facilitate footpath access, as well potential lighting impacts on this linear feature and woodland W2, both utilised by local bat assemblages for commuting and foraging.

6.183 The limited loss of hedgerow H4 is unlikely to have an impact on the way in which this linear feature is used by the local bat population. The bat assemblages recorded around these habitats, comprised of species which are more adapted to urban environments with greater lighting impacts including common and soprano pipistrelles. Therefore, through the implementation of appropriate buffers these habitats and a sensitive lighting strategy, these commuting and foraging corridors along hedgerow and woodland edge can be maintained.

6.184 It is therefore considered that there will be a negligible negative impact on the bat species at local level, from both development proposals.

Breeding birds

6.185 The Sewell Park surveys recorded general urban fringe bird assemblages similar to that were recorded across the Application site. Their proposals are expected to retain, buffer and create similar grassland and scrub habitats to those recorded across their site, effectively mitigating their impact on breeding bird assemblages across their site.

6.186 It is therefore considered that the overall cumulative impact from both the proposals will lead to a minor positive impact on the breeding bird assemblages at a local scale.

Farmland birds

6.187 The Sewell Park surveys did not record skylark on site, although linnet were recorded as breeding on site.

6.188 The Sewell Park site will provide suitable foraging and nesting habitats for the linnet recorded on site, and other farmland birds that use hedgerows. Furthermore, the application site will provide a large area of mixed scrub and species rich grassland within the GI whereby cumulatively habitats for linnets

[15] Badgerland – Territories (2024).

will be increased. Depending on the utilisation of the GI, this will lead to a negligible to minor positive impact on local farmland bird assemblages.

Residual effects

6.189 No additional residual significant effects are anticipated by the Sewel Land Trust site in combination with the application site.

CONCLUSION

6.190 The application site has been assessed as being beyond the zone of influence for the Chilterns Beechwood SAC and, therefore no impacts are likely.

6.191 A total of nine LWS are located within a 1km radius, with the Longspring Wood LWS located along the southern extent of the application site. The remaining LWSs are mainly located over 0.5km, with the majority supporting recreational use with the provisions of designated footpaths, dog waste bins and car parks, mitigating the recreational impacts expected. Further provision of significant GIwithin the proposed development, with circular walking routes, as well as amenity and recreational facilities is expected to mitigate any further impacts on these LWSs, where it has been assessed that there will be a negligible impact.

6.192 The implementation of the 15m buffer around Longspring Wood LWS/ancient woodland, and construction mitigation will ensure that there are no direct or indirect impacts from construction. The provision a signposted way marked route, dog waste bins, wildlife information posts, in combination with new structural planting and EMP, will protect and enhance the existing woodland and its ground flora and ensure its resilience in the future. It is therefore considered that there will be a minor positive effect from the proposals on the LWS.

6.193 The majority of the on site habitats are considered to be of low intrinsic value, including arable and amenity grassland which will be lost; while woodland and the majority of the hedgerows will be retained and buffered throughout the proposals. A range of proposed habitats including woodland, hedgerows, species rich grassland, mixed scrub, SuDS and individual trees, will be created within the proposals increasing the overall diversity and availability of habitats across the Application site, leading to and overall positive effect for the existing habitat on site. This is reflected throughout the biodiversity net gain assessment completed for this assessment which has demonstrated that the site can achieve the statutory 10% net gain on site.

6.194 A number of protected species have been recorded as utilising the current habitats on site, including badgers, bats, birds and reptiles. The majority of these species will be minimally impacted throughout the construction phase, with farmland birds considered to be the most significantly impacted at a local level.

6.195 The proposals will increase the diversity and availability of habitats across the Application site, which will benefit foraging, commuting and refuge resources for the protected species identified on site. Further specific actionable mitigation measures such as creation of hibernacula, installation of bat and bird boxes will be used to enhance the suitability of these habitats for these species. It is therefore assessed that the proposals will result in a negligible to minor positive long term impact at a local level.

6.196 Due to the loss of arable habitats, it was assessed that the farmland bird assemblages would be negatively impacted by the proposals. The incorporation of an additional area of agricultural to the north of the proposed site will further be enhanced through the creation of farmland bird plots, to be managed within the existing agricultural rotational management. It is considered that the enhancement of these existing offsite habitats, will appropriately mitigate the impact of the loss of arable habitats on site and provide more suitable habitats for theses specialist bird assemblages resulting in minor positive effect at a local level in the long term.

6.197 The assessment identifies that although the Application site is not that ecological rich, there are some IEF that could be adversely impacted in the long term if no mitigation measures are adopted. The degree of habitat diversity provided with specific species mitigation will result in an overall negligible to minor positive long term direct impact at a site/local level.

7 Landscape and visual

7.1 This chapter of the ES has been compiled by Define Planning and Design and concerns the likely significant environmental effects of the proposed development on the elements that make up the landscape; the specific aesthetic or perceptual qualities of the landscape; the character of the landscape; and people who will be affected by changes in views or visual amenity.

7.2 It is supported by the following technical appendices:

Appendix 7.1: Assessment methodology
Appendix 7.2: Supporting figures
Appendix 7.3: Extracts from published character guidance
Appendix 7.4: Viewpoint photography
Appendix 7.5: Assessment of landscape value
Appendix 7.6: Detailed landscape and visual assessment

ASSESSMENT METHODOLOGY

7.3 The methodology used for this landscape and visual impact assessment ("LVIA") follows the principles and approaches set out in the third edition of the 'Guidelines for Landscape and Visual Impact Assessment' ("GLVIA") and associated clarifications published by the GLVIA panel.

7.4 The purpose of LVIA is to identify likely landscape or visual effects from the development proposals and to identify potential measures to prevent, avoid or reduce adverse effects.

7.5 Landscape and visual assessments are separate, although linked, procedures. The landscape baseline, its analysis and the assessment of landscape effects all contribute to the baseline for visual assessment studies.

7.6 To understand the effectiveness of proposed landscape-based mitigation measures and changes to land management objectives, the LVIA considers effects at the following assessment stages:

(1) In construction: focusing on specific demolition and construction-related landscape and visual effects.

(2) At completion: the effects when all construction activities associated with the proposed development have been completed and the development is entirely in its operational phase.

(3) 15 years after completion: this timescale allows the assessment to consider effects once landscaping mitigation measures mature.

7.7 GLVIA3 recognises a clear distinction between the 'impact,' as the action that is being taken, and the 'effect,' as the change resulting from that action, and advises that the term 'impact' should not be used to mean a combination of several effects.

7.8 This assessment has been based on the maximum parameters of the proposed development, assessing the reasonable worst-case scenario in terms of height (scale) and extent (layout). This allows flexibility in terms of the final design of the proposed development in terms of its exact scale and layout, which will be determined at the reserved matters application stage.

7.9 Full details of the approach to assessing landscape and visual effects, along with details of the approach to assessing sensitivity of receptors, are provided in Appendix 7.1.

Study area

7.10 The study area used for assessing likely significant landscape and visual effects extends 3km from the centre of the site. This is shown in Figure 1 in Appendix 7.2. This study area was defined through a survey of the pattern of existing land use, landform and land cover within the landscape surrounding the site, through field survey activities and through the preparation of bare earth Zone of Theoretical Visibility ("ZTV") mapping.

7.11 The boundary of the study area does not define the area beyond which there will be no effect, rather it contains the area within which all 'likely significant' landscape and visual effects are predicted to occur.

7.12 Within the study area, the baseline study has analysed elements of the site's context, such as topography, existing vegetation, landscape and heritage designations, movement and landscape character.

Consultation

7.13 Engagement in relation to this LVIA has been undertaken with the landscape officer from Hertfordshire County Council and agreed the viewpoint locations and landscape and visual receptors to be considered within the ES. The assessment methodology that has been used for this LVIA was also agreed as part of the EIA Scoping exercise.

Legislative context

European Landscape Convention

7.14 The European Landscape Convention (ELC) of the Council of Europe promotes the protection, management and planning of the landscapes and organises international co-operation on landscape issues. The ELC was signed by the UK government in 2006 and established in March 2007.

7.15 This LVIA adopts the definition of landscape set out at Article 1 of the ELC: *"an area, as perceived by people, whose character is the result of the action and interaction of natural and/or human factors"*. The LVIA recognises also the integral value of all landscapes and the LVIA methodology, detailed in Appendix 7.1, defines value based on a landscape's qualities and condition, rather than designations alone.

National Planning Policy Framework

7.16 Section 12 of the National Planning Policy Framework (NPPF)[16] sets out national policy in relation to the design of new development. Paragraph 135 lists several criteria in respect of the design of new development. The criteria explain that development should be *"...visually attractive as a result of good architecture, layout and appropriate and effective landscaping...."* and *"...sympathetic to local character and history, including the surrounding built environment and landscape setting, while not preventing or discouraging appropriate innovation or change (such as increased densities)"*.

7.17 Section 15 of the NPPF sets out national policy on conserving and enhancing the natural environment. Paragraph 180 sets out various criteria which afford protection to the natural and local environment including *"protecting and enhancing valued landscapes...."* and *"recognising the intrinsic character and beauty of the countryside, and the wider benefits from natural capital and ecosystem services – including the economic and other benefits... of trees and woodland"*. Paragraph 182 of the NPPF advising also that *"Great weight should be given to conserving and enhancing landscape and scenic beauty in... Areas of Outstanding Natural Beauty which have the highest status of protection in relation to these issues."* Paragraph 186 states that *"any development resulting in the loss or*

[16] National Planning Policy Framework, Department for Levelling Up Housing & Communities, December 2023.

deterioration of irreplaceable habitats (such as ancient woodland and ancient/veteran trees) should be refused, unless wholly exceptional reasons and a suitable compensation strategy exists".

7.18 Section 16 of the NPPF considers the historic environment and sets out various policies and principles for development affecting heritage assets (e.g. listed buildings and conservation areas).

Local policy – extant policy

7.19 Extant local policy published by St Albans City & District Council ("SACDC") is set out in the District Local Plan Review 1994 – Saved and Deleted Policies Version (July 2020). Of particular relevance to the purposes of this assessment is Policy 69 (General Design and Layout), which requires development to have an adequately high standard of design, taking account of the scale and character of its context, although other policies have some relevance also.

Local policy – emerging policy

7.20 Emerging local policy published by SACDC is set out in the Draft Local Plan 2041 - Regulation 19 Local Plan. This includes policies that set out approaches by which the Council will enhance tree cover in the District and protect existing woodlands; require development to take account of the character and pattern of development in its locality and to respond positively to its context, taking into account the local distinctiveness of an area, its scale, form, massing, setting, height, character and building line; and advise that proposals that are significantly taller than the prevailing built form will be refused. Policy NEB10 (Landscape and Design) also requires all major developments outside the settlement area to be supported by a LVIA and advises that any development proposal in a Landscape Character Area must conserve, restore or enhance the prevailing quality, character and condition of the natural and historic landscape.

Assessment of process

Construction phase

7.21 The details of the construction works are not finalised at this stage, but it is assumed for the purposes of this assessment that the build out of the proposed development will follow standard construction techniques employed for this type of development as follows:

(1) Site clearance and plateau formation / cut and fill;

(2) Installation of temporary welfare and office facilities, car parking and plant, including new light sources and mobile cranes (in accordance with aviation safeguarding requirements/ limitations), temporary fencing and signage, materials storage and highway works; and

(3) Construction activity including super structure and building envelope, installation of internal road infrastructure and services, completion of external works, including landscaping, permanent lighting, and signage.

7.22 There are no specific construction commitments that this ES chapter relies upon in assessing the likely scale and significance of any landscape and visual effects throughout the site clearance and construction works on site.

7.23 The following changes to the landscape of the site are likely during the construction phase:

(1) Removal of existing areas of hardstanding;
(2) Removal of a small number of trees and hedgerows to facilitate construction;
(3) Introduction of measures to protect trees to be retained;
(4) Stripping and stockpiling of topsoil;
(5) Erection of temporary site welfare facilities and compound(s);
(6) Erection of protective site hoardings;
(7) Erection of temporary and permanent signage and boundary treatments;
(8) Provision of temporary site lighting when work is in progress;
(9) Provision of utilities, such as water, drainage, power and lighting;

(10) Stockpiling and storage of imported materials;
(11) Storage and movement of construction plant (e.g. excavators, cranes and lorries);
(12) Storage and movement of other temporary site traffic (e.g. worker vehicles);
(13) Construction of new site roads and installation of highways infrastructure;
(14) Excavation of drainage infrastructure measures and wetlands;
(15) Erection and presence of partially constructed new buildings;
(16) Installation of street furniture; and
(17) Installation of street trees and planting up of proposed landscape areas.

Operation phase

7.24 To understand the full implications of the landscape and visual effects of the completed development, the effects have been assessed at completion (day 1) with primary (inherent) mitigation in place, and 15 years after completion with primary (inherent) mitigation in place, then assessed again once any secondary (additional) mitigation and enhancement measures have been put in place.

7.25 Primary mitigation refers to mitigation fixed within the parameter plans; this includes measures such as reduced building height zones, offsets from boundaries and landscape zones which will be part of any proposed development that comes forward as approved by the outline planning consent. The primary mitigation included within this assessment is detailed within the 'Inherent and Standard Mitigation' section of this ES chapter.

7.26 Secondary mitigation refers to mitigation identified as a result of the assessment process, that is proposed in addition to those inherent to the proposed development and fixed by the parameter plans; this may include off site planting or specific requirements to be further developed at the reserved matters stage. These measures are proposed to reduce or mitigate assessed adverse effects on landscape and visual receptors.

7.27 It is anticipated that all of the construction activities outlined above would cease upon completion. Introduced built form and vegetation would however remain present at this stage and would be experienced alongside operational activities including:

(1) Access arrangements and traffic movements;
(2) Operational site lighting;
(3) Movement of operational site traffic and car parking;
(4) Operational signage and boundary features;
(5) The operational landscape, including landform, structure planting and hard landscape features;
(6) Movement of pedestrians and cyclist users of the operational development; and
(7) Landscape management operations and activities.

15 years after completion

7.28 It is anticipated that introduced built form and most of the operational elements listed above would remain 15 years after completion. It is however anticipated that planting introduced as landscape-based mitigation during the construction phase would have reached a degree of maturity by this stage.

Phasing

7.29 The assessment has assumed a likely worst-case scenario whereby construction phase activities would take place across several parts of the site, over an extended period of time (approximately 10 years), with mitigation planting delivered within the latter part of the works phase for each phase of development built out.

Assessment criteria

7.30 The assessment comprises the following key stages:

(1) Establishing a study area for assessing landscape and visual effects;

(2) Establishing the landscape and visual baseline conditions (as per the above);

(3) Identifying potential landscape and visual receptors to a landscape or visual effect;

(4) Considering the value, susceptibility and sensitivity of these receptors to the type of change (impact) proposed;

(5) Determining the magnitude of change (impact) that would be experienced by those or at those receptors;

(6) Applying professional judgement to advise the significance that should be attributed the resulting effect; and

(7) Considering any additional mitigation and determining any residual effects.

Baseline data collection

7.31 Establishing the baseline conditions involves the following:

(1) The review of Ordnance survey (OS) maps and digital data to identify local features.

(2) The mapping of any special designated landscapes (such as National Landscapes, National Parks, Registered Park and Gardens, Green Belt, Conservation Areas, listed buildings, scheduled ancient monuments).

(3) The review of published Landscape Character Assessments (National and Local Authority Character Assessments) followed by verification in the field to determine the character of the site and study area.

(4) Describing the existing landscape elements that contribute to landscape character (landscape elements include geology, soils, landform, drainage and waterbodies, existing vegetation and land/field patterns, settlements and buildings, public access, land use and other characteristic elements of the existing local landscape).

(5) Defining the area within which the proposed development may be visible.

(6) Identifying the different groups of people within the study area who may experience views of the proposed development.

(7) Identifying specific viewpoints and describing the nature of views at the viewpoints.

Identifying receptors

7.32 Once the baseline has been established the first step in the assessment process is to identify the components of the landscape and the people that are likely to be affected by the proposed development. These are defined as landscape receptors and visual receptors respectively and include the physical landscape, aesthetic or perceptual qualities of the landscape, the character of the landscape and groups of people who may experience changes to their views as a result of the proposed development.

7.33 Consideration is then given to the sensitivity of each receptor by combining judgements about the value and the susceptibility of the receptor to the form of development proposed. The criteria for judging the sensitivity of each receptor are recorded as being high, medium or low, based on the criteria set out in Tables A.1-A.6 in Appendix 7.1.

Evaluating the magnitude of an effect

7.34 The magnitude of effect is then described for both landscape and visual receptors. The assessment endeavours to make informed judgements that are applicable throughout the year and includes the consideration of seasonal views and the changing nature of vegetation.

7.35 The magnitude of effect on a receptor is assessed in terms of the following:

(1) Size or scale: The extent to which the removal or addition of landscape features alters the existing landscape or view;

(2) Geographical extent: The area over which effects would be evident;

(3) Duration of the effect: Whether effects would be experienced in the short (0-5yrs), medium (5-10yrs) or long term (10-25yrs); and whether effects would be permanent, temporary, intermittent or continuous; and

(4) Reversibility: The ability of effects caused by the proposed development to be reversed.

7.36 For this assessment, effects that would be considered permanent are those typically occurring over the long-term, such as the construction of buildings and re-profiling of land, as these cannot practicably be reversed. Vegetation removal is also considered to be permanent where it cannot be planted in the same location and reach maturity over the short or medium-term. Mitigation planting has the potential to compensate for the loss of existing vegetation if similar types and species are planted and could provide similar benefits over the medium to long-term.

7.37 Temporary effects would typically occur over a short to medium term duration and would mainly occur during the demolition and construction phase. Development that may result in temporary effects would typically include, for example, the introduction of temporary site security fencing, temporary hard standing areas, construction machinery, temporary buildings and compounds, haul roads, earthmoving and stockpiles, or lighting.

7.38 Landscape and visual effects resulting directly from the proposed development itself are defined as being direct, and those resulting from a consequential change because of the proposed development are defined as being indirect.

7.39 Judgements about the magnitude of change on receptors identify whether the impact would be negative (adverse) or positive (beneficial), are described with inherent mitigation in place, and are recorded as being high, medium, low, negligible or no effect, based on the criteria set out at Table A.7 in Appendix 7.1.

Evaluating the significance of an effect

7.40 The overall significance of a landscape or visual effect is determined by combining the sensitivity of a landscape or visual receptor with its magnitude of change. The manner in which judgements of sensitivity and magnitude of change can be combined to reach a judgement of overall effect are set out in Table 23. This is however only a framework for decision making and each judgement is considered on a case-by-case basis against the criteria of what is meant by each grade of overall effect judgement provided in at Table A.9 in Appendix 7.1.

Table 23: Combination of judgements to determining overall landscape and visual effects

MAGNITUDE OF CHANGE	LANDSCAPE AND VISUAL RECEPTOR SENSITIVITY		
	HIGH	MEDIUM	LOW
High	Major	Moderate - Major	Moderate
Medium	Moderate - Major	Moderate	Moderate - Minor
Low	Moderate	Moderate - Minor	Minor
Negligible	Minor - Negligible	Minor - Negligible	Negligible
No change	No effect	No effect	No effect

7.41 Major and Moderate-Major environmental effects are typically considered 'significant' for the purposes of this ES chapter, whilst moderate, minor and negligible are typically considered 'not significant.' In accordance with clause 3.34 of GLVIA3 however, effects not considered to be significant are not totally disregarded in the ES.

Sources of information

7.42 The published documentation that has informed the baseline includes:

(1) National Character Area: 110 'Chilterns', published by Natural England in February 2013.

(2) National Character Area: 111 'North Thames Basin', published by Natural England in July 2013.

(3) The 'Hertfordshire Landscape Character Area Statements', which were produced by the Babtie Group as part of the 'Hertfordshire Landscape Character Assessment' between 2000 and 2005.

(4) The 'Tranquillity Map' for Bedfordshire and Hertfordshire, produced by the Campaign to Protect Rural England and published March 2007.

Assumptions

7.43 The following assumptions have been made in undertaking this LVIA, as are relevant to policy requirements. It is assumed that SACDC will secure the below using appropriately worded planning conditions attached to an outline planning consent:

(1) Lighting treatments to be agreed at the RMA stage would be designed to minimise the occurrence of light pollution, employing energy-efficient forms of lighting that also reduce light scatter and have regard to the current guidelines established by the Institute of Lighting Professionals;[17] and

(2) The proposed development would deliver high-quality place design, that is responsive to the local area and which reflects the principles set out within SACDC's Strategic Sites Design Guidance.

7.44 It is assumed also that all existing vegetation within the site, unaffected by the proposed development, would be retained and protected in accordance with BS5837:2012.[18]

7.45 Predicting the long-term growth rate of trees is not an exact science due to the numerous variables a tree may encounter in its life, including ground conditions, competition, disease and ongoing management. As an approximation, with proposed trees continuing to grow at a rate of 250mm a year, it would take over 60 years to reach a height of 17m tall [1.8m planting height plus (60x250mm growth/year)].

7.46 The following stock sizes and growth rates are assumed for proposed planting:

(1) Proposed heavy standard trees (planted at a height of 3.5-4.25m) are assumed to achieve heights of between 6-7m after 5 years, 8-9m after 10 years and 10m+ after 15 years;

(2) Proposed light standard trees (planted at a height of 2.5-3m) are assumed to achieve heights of 5m after 8 years, 7-8m after 15 years, 9-10m after 25 years;

(3) Proposed hedgerows vegetation on the southern boundary of Woollam Playing Fields would be planted using 0.6-0.8m height plant stock (or larger) and would be maintained at a height of at least 2.1m within 8 years;

(4) Proposed hedgerows elsewhere within the site would be planted using 0.6-0.8m height plant stock (or larger) and would be maintained at a height of at least 1.2m within five years; and

(5) Proposed scrub vegetation (planted at a height of 0.3-0.8m) is assumed to achieve a height of 2-3m within five to 10 years.

[17] Guidance Note 01/2: The Reduction of Obtrusive Light. Institute of Lighting Professionals 2021.

[18] The British Standard "Trees in Relation to Design, Demolition and Construction to Construction - Recommendations" (2012).

Assessment limitations

7.47 Fieldwork was undertaken from publicly accessible locations only. The LVIA does not therefore consider private views from residential properties. Some viewpoints will be situated in close proximity and will show the general nature of the view for residents. Where viewpoints are situated on a settlement edge the degree of predicted visibility from properties has been referenced.

7.48 Assessment of the visual receptors makes certain assumptions in regards to private dwellings, paths or roads. Where it was not possible to visit a receptor, due to it not being publicly accessible, certain assumptions have been made. As part of the initial baseline, an on-site evaluation was conducted, whereby views out of the site were assessed to give an indication as to what can be seen from surrounding receptors.

7.49 No other limitations have been identified that would affect the conclusions of this assessment for EIA purposes.

BASELINE CONDITIONS

7.50 This section describes the baseline landscape and visual conditions associated with the site and surrounding area. This section includes:

(1) a description of the various landscape elements and features present within the site and study area;

(2) a summary of the landscape character areas identified in published documentation;

(3) a description of the site's visibility within the study area; and

(4) identification of any changes anticipated within the landscape (excluding the allocation scheme) as a result of development allocations, consented developments etc.

7.51 The published documentation and other sources that have informed the landscape baseline are identified in the 'sources of Information' section above.

Landscape elements and features

Landform, hydrology, geology and soils

7.52 The site occupies land on the edge of a plateau, forming a ridge between the Cathedral City of St. Albans and town of Harpenden to the north; and at the head of a valley which extends in a north-eastward direction to the village of Sandridge. The plateau landscape to the west of the site extends as a finger of raised farmland north-eastward in the northern part of the site and as a sand ridge in its south. The site is also bounded along its eastern edge in part by embankment and in part by cutting, associated with the Midland Main Line railway. Landform within the site ranges from around 125m AOD in its north west (where it adjoins Harpenden Road) to around 105m AOD in its east (where bordering the railway embankment). The landform extending north and south from the site is undulating, forming a series of plateau ridgelines. There is also a further area of raised land, located beyond Sandridge village, within the eastern part of the study area as shown in Figure 2 in Appendix 7.2.

7.53 The site overlies a chalk bedrock geology with clay-with-flints on higher plateau areas. Soils across the site are generally slightly acid loamy and clayey with impeded drainage, in particular over the plateaus where some slight seasonal waterlogging occurs. Soil becomes fine, silty and well drained within valley bottoms, resulting in there being only very infrequently areas of standing water found within these locations.

Land cover, vegetation and land use

7.54 The majority of the site comprises arable farmland, however some land in the north western part of the site is presently in use for sports, forming part of Woollam Playing Fields. The site also contains

several belts of trees and hedgerows, including Longspring Wood, which extends along the southern boundary of the site and is a designated area of Ancient Woodland and Local Wildlife Site; and an overgrown belt of semi-mature planting which extends along the edge of the plateau in the northern part of the site as shown on Figure 3 in Appendix 7.2.

7.55 The site is crossed by several (largely intact) hedgerows with occasional hedgerow trees, most of which align minor lanes. The site is also enclosed by some mature hedgerows along its western boundary, including a defined section of 'important hedgerow' where it borders Harpenden Road, and is bounded to its east by scrub vegetation bordering the railway.

7.56 The site adjoins St. Albans Girls School and land to be developed for housing (known as Sewell Park, planning reference 5/2021/0423) to its west, Porter's Wood industrial estate to its south and further farmland to its north and east. The New Greens residential estate extends westward from the site, beyond Harpenden Road, to the north of which is located Townsend Church of England Secondary School and an area of dense scrub woodland. Pockets of woodland are also present across the surrounding landscape, with a few Ancient Woodlands both to the west and north east of the site.

7.57 An arboricultural survey of the site recognises there to be five category A trees and two category A tree groups and hedgerows; nine category B trees and 11 category B tree groups and hedgerows; and two category C trees and seven category C tree groups and hedgerows within the site. One of the trees (T14) within the site is classified as a veteran as illustrated the arboricultural survey in Appendix 6.8.

7.58 Heartwood Forest, a 347-hectare area of publicly accessible woodland owned and managed by the Woodland Trust, is located around 400m to the north east of the site; and Jersey Farm Park Woodland, an area of publicly accessible mixed woodland and meadowland, is located around 800m to the east of the site. There are also some areas of informal open space bordering Harpenden Road to the west of the site and within the wider settlement; and areas of open access land within the existing settlement to the south of the site and at the edge of Harpenden and beyond Heartwood Forest to the far north of the study area.

Public access and transport routes

7.59 The site borders Harpenden Road (A1081) along its western boundary and the Midland Main Line railway along its eastern boundary, as shown on Figure 4 in Appendix 7.2. The site is also crossed from north east to south west by Sandridgebury Lane, which provides a connection eastward beyond the railway to the village of Sandridge; and from which a private farm access extends northward to serve three properties, to the north east of the site. The site also borders Valley Road in its south west, against St Albans Girls' School.

7.60 Public footpath St Albans City 096 provides a connection through Longspring Wood, near to the southern boundary of the site, before connecting northward to Sandridgebury Lane, close to the railway and near the eastern boundary of the site. A permissive path also follows the field boundary immediately to the north of Longspring Wood and provides an alternative connection within the site to that offered by this public footpath. Several other rights of way provide connections through the landscape to the north, east and west of the site, some of which form part of the Hertfordshire Way long-distance footpath.

Cultural patterns and historic features

7.61 The site sits immediately to the north of the Cathedral City of St Albans and approximately 2km south of the town of Harpenden. The village of Sandridge is located around 750m to the east of the site and there are also a few hamlets within the landscape surrounding the site, including Childwick Green to the north west (refer to Figure 5 in Appendix 7.2).

7.62 There are no designated heritage assets within the site, but there are several Grade II listed buildings within 1km of the site (considered in Chapter 9).

(1) A cluster of grade II listed buildings around Childwick Bury House and Childwick Green, including Childwick Bury Manor and Coach House located approximately 900m north west of the site.

(2) A cluster of grade II listed buildings in Sandridge, including Sandridge House and the Church of St Leonard located approximately 750m east of the site.

7.63 There are also several other designated heritage assets within the nearby landscape, including Beech Bottom Dyke, an Iron Age Territorial Boundary located approximately 250m south of the site.

7.64 The centre of St Albans, approximately 2.3km south of the site, is also home to several listed buildings, including the Grade I listed Clock Tower and the site of St Albans Abbey.

7.65 There are no registered Parks and Gardens within the site, the nearest being the Gorhambury Estate located approximately 4km west of the site.

7.66 A review of historic mapping suggests that, whilst the field pattern within the site appears to have remained unchanged for over 100 years, much of what would have historically been farmland to its south and west was developed for housing in post-war years.

Aesthetic or perceptual qualities

7.67 The land to the north and east of the site is largely rural and much of the site is visually separated from the wider settlement due to landform and intervening vegetation. However, the site's proximity to the railway and Harpenden Road, alongside other visual and/or audible detractors (e.g., flood lighting and built form within the Woollam Playing Fields and St Albans Girls' School) reduce its sense of remoteness and tranquillity to some extent.

7.68 The Campaign to Protect Rural England (CPRE) categorise the northern part of the site (north of the hedgerow) as 1-2 NanoWatts/Cm2/sr level of radiance (the 4th darkest category on their nine-category scale). The southern part of the site falls within CPREs 2-4 NanoWatts/Cm2/Sr (the 5th darkest category on their nine-category scale).

Landscape character

The character areas

7.69 National Character Areas ("NCAs"), defined by Natural England, subdivide England based on a combination of landscape, biodiversity, geodiversity and economic activity. NCAs share similar landscape characteristics, and follow natural lines in the landscape rather than administrative boundaries, making them a good decision-making framework for the natural environment.

7.70 The site falls within the NCA 110: 'The Chilterns'. This NCA is extensively wooded and farmed landscape and is underlain by a chalk bedrock that rises up from the London Basin to form a north-west facing escarpment offering long views over the adjacent vales. The site is on the southern edge of this NCA, with NCA 111: 'Northern Thames Basin' adjacent to its boundary.

Local landscape character

7.71 Local Landscape Character Areas ("LCA") are defined within the Hertfordshire Landscape Character Assessment. This assessment defines the site as falling wholly into the 'Ayres End Valleys and Ridges - B' LCA. Adjacent to the western site boundary is the Childwick Plateau. Other LCAs within the surrounding study area include the 'Harpenden Common', 'Nomansland Common', Symondshyde Ridge' and the 'Ayres End Valleys and Ridges - A'.

7.72 Key characteristics of the Ayres End Valleys and Ridges - B LCA (those most relevant to the site are in bold) include:

(1) Open dry valleys overlooked by smaller areas of plateau on the fringes;

(2) Quiet area with few visual detractors except the A1081 and mainline railway to the west.;

(3) Small woods on the upper slopes emphasise the valleys;

(4) Area served by narrow, winding roads lined by dense mixed hedgerows;

(5) Mixed arable, pasture and recreational land uses;

(6) Number of equestrian establishments associated with small country houses, including The Grove and Sandridgebury;

(7) Locally prominent built edges to adjacent settlements; and

(8) Isolated properties or small clusters of dwellings, generally with strong vernacular architecture.

7.73 The location of these LCAs is illustrated in Figure 6 in Appendix 7.2: and full details about these LCAs is provided in Appendix 7.3.

Visual context

7.74 Analysis of ZTV mapping shown at Figure 7 in Appendix 7.2 indicates visibility toward the site from numerous locations within the surrounding landscape, including the higher lying land east of Sandridge, and along the southern edge within the city of St Albans. Actual visibility into the site is however contained to relatively few locations due to intervening vegetation and built form within the surrounding area, with views into the site entirely screened by woodland from the Beech Bottom residential area and Porter's Wood industrial estate and from St Albans itself.

7.75 The site is prominent in views experienced by users of footpath St Albans City 096 (where bordering the railway) and from the permissive path that passes along the southern edge of the site (refer to viewpoints 7 and 8 in Appendix 7.4: Viewpoint Photography). However. large hedgerows and mature trees along Sandridgebury Lane, restrict views from lower-lying areas within the site boundary (refer to viewpoints 11, 14 and 15 in Appendix 7.4: Viewpoint Photography); as does hedgerow vegetation at the edge of the plateau from within Woollam Playing Fields (refer to viewpoints 4a and 4b in Appendix 7.4: Viewpoint Photography).

7.76 Views from the west along the Harpenden Road, including those from the New Greens residential estate, are mostly obscured by intervening built form and vegetation (refer to viewpoints 9, 12 and 21 in Appendix 7.4: Viewpoint Photography), although glimpsed views are possible further to the north, near to the entrance into the Woollam Playing Fields (refer to viewpoint 4 in Appendix 7.4:).

7.77 The site is evident in middle-distance south-westerly orientated views experienced by users of public bridleway Sandridge 009 (which forms part of the Hertfordshire Way), where passing the southern edge of Heartwood Forest (refer to viewpoints 1 and 2 in Appendix 7.4); and is identifiable, beyond the railway, in middle-distance views from public footpath Sandridge 011, west of the village of Sandridge (refer to viewpoint 16 in Appendix 7.4: Viewpoint Photography). The site is also discernible in longer-distance views from some rights of way east and northeast of Sandridge (refer to viewpoints 17 and 20 in Appendix 7.4), and is discernible in glimpsed views from some locations within the Jersey Farm Park Woodland (refer to viewpoint 19 in Appendix 7.4).

7.78 The site is almost entirely screened in middle- and long-distance views from within Heartwood Forest, from beyond the site boundary on Sandridgebury Lane and from the Hertfordshire Way to the west of the railway line by intervening landform, vegetation and built form (refer to viewpoints 5, 6, 10 and 3 in Appendix 7.4). The site is also screened in more distant views from the north (refer to viewpoint 18 in Appendix 7.4).

Landscape value

7.79 Paragraph 180(a) of the NPPF advises that planning policies should contribute to and enhance the natural and local environment by, amongst other measures, '*protecting and enhancing valued landscapes.*'

7.80 The Landscape Institute's Technical Guidance Note 02/21 (TGN 02/21)[19] provides information and guidance to landscape professionals and others who need to make judgments about the value of a landscape, outside national landscape designations, in the context of the UK Town and Country Planning system.

7.81 The site falls outside of SACDC's designated Landscape Conservation Area and an assessment of the landscape value of the site (refer to Appendix 7.5) determines it to be of medium overall landscape value. The site is accordingly assessed to not be a 'valued landscape' for the purposes of NPPF paragraph 180(a).

Landscape receptors

7.82 The landscape receptors that may be sensitive to the proposed development during the construction or operational phases are as follows:

(1) Ayres End Valleys and Ridges LCA.
(2) Landscape elements within the site.

7.83 The sensitivity of each landscape receptor is determined in the Detailed Landscape Assessment provided as Appendix 7.6, and is summarised in Table 24.

Table 24: Sensitivity of landscape receptors

ENVIRONMENTAL RECEPTOR/RESOURCE	SENSITIVITY
Ayres End Valleys and Ridges LCA	Medium / High (medium-high susceptibility / medium value)
Landscape elements within the site	Medium / High (medium susceptibility / medium-high value)

Visual receptors

7.84 The visual receptors that it is considered may be sensitive to the proposed development during the construction or operational phases are as follows:

(1) Users of public footpath St Albans City 096.
(2) Users of the permissive path through the site.
(3) Users of public bridleway Sandridge 009.
(4) Users of public footpath Sandridge 011.
(5) Users of rights of way east and northeast of Sandridge.
(6) Users of Sandridgebury Lane.[20]
(7) Users of Harpenden Road.
(8) Users of the Midland Main Line railway.
(9) Users of Old Albanians Rugby Club.
(10) Visitors to the Heartwood Forest.
(11) Visitors to the St Albans Girls School.
(12) Visitors to Jersey Farm Park Woodland.
(13) Residents of Harpenden Road.
(14) Residents of Childwick Green.

[19] Technical Guidance Note 02/21 'Assessing landscape value outside national designations', Landscape Institute, February 2021.

[20] Effects on the users of Sandridgebury Lane receptor are considered separately for those moving within the site and beyond its limits. Effects on users within the site encompassing also those moving along Valley Road. Judgement about the susceptibility of users is based on the existing (principally vehicular) user group.

7.85 The sensitivity of each visual receptor is determined in the Detailed Visual Assessment provided as Appendix 7.6 and is summarised in Table 25.

Table 25: Sensitivity of visual receptors

ENVIRONMENTAL RECEPTOR/RESOURCE	SENSITIVITY
Users of public footpath St Albans City 096	Medium / High (high susceptibility / medium value)
Users of the permissive path through the site	Medium / High (high susceptibility / medium value)
Users of public bridleway Sandridge 009	Medium / High (high susceptibility / medium value)
Users of public footpath Sandridge 011	Medium / High (high susceptibility / medium value)
Users of rights of way east and northeast of Sandridge	High (high susceptibility / medium-high value)
Users of Sandridgebury Lane	Medium (medium susceptibility / medium value)
Users of Harpenden Road	Medium (medium susceptibility / medium-high value)
Users of the Midland Main Line railway	Medium (low-medium susceptibility / medium value)
Users of Old Albanians Rugby Club	Medium (low-medium susceptibility / medium value)
Visitors to the Heartwood Forest	High (high susceptibility / medium-high value)
Visitors to the St Albans Girls School	Low / Medium (low-medium susceptibility / medium value)
Visitors to Jersey Farm Park Woodland	High (high susceptibility / medium-high value)
Residents of Harpenden Road	Medium / High (medium-high susceptibility / medium value)
Residents of Childwick Green	High (high susceptibility / medium-high value)

INHERENT AND STANDARD MITIGATION

Development design

7.86 The proposed development has evolved to incorporate the following inherent mitigation measures, which are detailed within Figure 8 in Appendix 7.2.

(1) The proposed development has been landscape-led, informed by the testing of augmented reality modelling from selected landscape viewpoints within the surrounding landscape, positioning taller built form in the less sensitive western part of the site.

(2) No development is proposed within 15 metres of Longspring Wood in the south part of the site.

(3) Structure planting, in the form of groups of tree planting and shrub/scrub, is proposed in the land immediately west of the railway embankment, along the edges of the proposed built edge, as well as within the 'common' landscape open space at the centre of the development, to provide screening in views from the north east and east.

(4) Protection and infilling of all existing boundary vegetation where possible, apart from that impacted by the proposed vehicular access off the Harpenden Road, and small breaks in existing hedgerows for footpath access across the site.

(5) A hedgerow with trees is to be planted along the southern boundary of Woollam Playing Fields to help screen proposed fencing in this area.

(6) Groups and avenues of trees are proposed within the development parcels to break up the massing of the built form and provide additional greening. In particular in the southernmost

parcel of the site, immediately adjacent to the ancient woodland, trees within the parcel will help to bed this into the existing vegetation.

(7) Road infrastructure in the southern part of the site ensures houses and the road network are positioned in parallel to the contours of the slope and will include a tree line of large street trees such as lime or elm, to help reduce the massing of proposed built form in views from the north east and to help assimilate this housing into the surrounding landscape.

(8) A new 'green link' between Sandridgebury Lane and Harpenden Road will be created in the northern part of the site and planted with trees, shrub and scrub to break up the massing of the development in views from the east.

Good practice

7.87 Good practice measures to protect the landscape and people's visual amenity during construction will be set out and explained in the CEMP. A summary of the measures it is assumed would be included within that document is set out below.

(1) Contractors will employ appropriate measures to protect the landscape from construction activities, to manage and maintain landscape works provided as part of the proposed development and to protect people's visual amenity;

(2) Construction-related impacts on landscape and visual amenity will be controlled through the following;

(3) Protection of existing elements of the landscape that are to be retained;

(4) Careful design and management of temporary construction components in response to landscape character and visual amenity; and

(5) The effective implementation of operational design measures, as early as reasonably practicable during the construction programme, which have a role in mitigating landscape and visual impacts.

7.88 Site hoarding will be erected at the perimeter of construction working areas, and contractors will ensure that construction sites are thoroughly cleared of all construction related machinery, facilities, structures, and materials and waste upon completion of works.

7.89 The contractors will ensure the functionality of the PRoW network is protected throughout construction, enabling users to continue to exercise their rights whilst also being protected from construction traffic.

7.90 The contractors will employ a specialist arboricultural consultant to oversee works relating to the management and protection of trees and any works to trees would be carried out in accordance with BS5837: 2012[21].

7.91 The contractors will employ a specialist soil consultant to oversee works relating to soil handling and any soil handling would be carried out in accordance with the Department for the Environment, Food and Rural Affairs ("DEFRA") 'Construction Code of Practice for the Sustainable Use of Soils on Construction Sites' (2009).

7.92 It is proposed that working hours would be limited where possible to avoid the need for artificial lighting.

[21] 'BS5837: 2012: Trees in relation to design demolition and construction. Recommendations', published by BSi, April 2012.

7.93 All landscape-based mitigation would be managed and maintained to a high standard throughout the construction and operational phases, in accordance with a management plan, to be agreed with the local authority though a suitably worded planning condition.

ASSESSMENT OF ENVIRONMENTAL EFFECTS – LANDSCAPE

7.94 The magnitude of change and significance of effect for each landscape receptor in the construction phase, at completion, and 15 years after completion is detailed at Appendix 7.6, with main effects identified and other assessed effects summarised below.

Construction phase

7.95 The Ayres End Valleys and Ridges LCA is assessed to experience a Moderate-Major adverse significance of effect during the construction phase, which is significant. This is because the proposed development would directly change part of the Ayres End Valleys and Ridges LCA, introducing uncharacteristic features which would be locally noticeable, would locally adjust the pre-existing landform and would impact upon some of the more common features of this LCA present within the site.

7.96 The landscape elements within the site receptor is assessed to experience a Moderate-Major adverse significance of effect during the construction phase, which is significant. This is because – although most of the more valued vegetation would be retained and protected throughout this period - development would (alongside other vegetation) result in the clearance of some valued vegetation (notably a section of 'important' hedgerow bordering Harpenden Road.

7.97 The magnitude of change for each landscape receptor in the construction phase is summarised in Table 26.

Table 26: Magnitude of change predicted for landscape receptors during construction phase

LANDSCAPE RECEPTOR/RESOURCE	MAGNITUDE OF CHANGE
Ayres End Valleys and Ridges LCA	Medium (local; direct; medium-term; permanent; irreversible)
Landscape elements within the site	Medium / High (local; direct; long-term; permanent; irreversible)

7.98 The significance of effect for each landscape receptor in the construction phase is summarised in Table 27.

Table 27: Significance of effect predicted for landscape receptors during construction phase

LANDSCAPE RECEPTOR/RESOURCE	SENSITIVITY	MAGNITUDE OF EFFECT	SIGNIFICANCE OF EFFECT
Ayres End Valleys and Ridges LCA	Medium / High	Medium	Moderate-Major adverse
Landscape elements within the site	Medium / High	Medium / High	Moderate-Major adverse

Operation phase – at completion

7.99 The Ayres End Valleys and Ridges LCA is again assessed to experience a Moderate-Major adverse significance of effect at completion, which is significant. This is because - although the operational development is likely to contrast less with the pre-existing character of this LCA – several aspects of the development would remain as distinctive and uncharacteristic features of this LCA at this stage.

7.100 The landscape elements within the site receptor is also again assessed to experience a Moderate-Major adverse significance of effect at completion, which is significant. This is because – although the public's accessibility through the site would be increased and retained areas of vegetation (alongside

new planting) would have been brought into enhanced management – the loss to valued vegetation cover adjoining Harpenden Road is still assessed to remain very noticeable at this stage.

7.101 The magnitude of change for each landscape receptor at completion is summarised in Table 28.

Table 28: Magnitude of change predicted for landscape receptors at completion

LANDSCAPE RECEPTOR/RESOURCE	MAGNITUDE OF CHANGE
Ayres End Valleys and Ridges LCA	Medium (local; direct; long-term; permanent; irreversible)
Landscape elements within the site	Medium (local; direct; long-term; permanent; irreversible)

7.102 The significance of effect for each landscape receptor at completion is summarised in Table 29.

Table 29: Significance of effect predicted for landscape receptors at completion

LANDSCAPE RECEPTOR/RESOURCE	SENSITIVITY	MAGNITUDE OF EFFECT	SIGNIFICANCE OF EFFECT
Ayres End Valleys and Ridges LCA	Medium / High	Medium	Moderate-Major adverse
Landscape elements within the site	Medium / High	Medium	Moderate-Major adverse

Operation phase – 15 years after completion

7.103 The Ayres End Valleys and Ridges LCA is assessed to experience a Moderate adverse significance of effect 15 years after completion, which is not significant. This is because, although development would still on balance cause harm to this LCA - mitigation planting and changes to landscape management would be anticipated to further strengthen vegetation coverage and public access within the LCA at this stage.

7.104 The landscape elements within the site receptor are assessed to experience a Moderate beneficial significance of effect at completion, which is not significant. This is because hedgerow losses adjoining Harpenden Road would be largely restored by this stage, proposed mitigation planting would have established to increase overall vegetation cover and proposed stewardship measures can be expected to bring various landscape features into enhanced management.

7.105 The magnitude of change for each landscape receptor 15 years after completion is summarised in Table 30.

Table 30: Magnitude of change predicted for landscape receptors at 15 years after completion

LANDSCAPE RECEPTOR/RESOURCE	MAGNITUDE OF CHANGE
Ayres End Valleys and Ridges LCA	Low / Medium (local; direct; long-term; permanent; irreversible)
Landscape elements within the site	Medium (local; direct; long-term; permanent; irreversible)

7.106 The significance of effect for each landscape receptor 15 years after completion is summarised in Table 31.

Table 31: Significance of effect predicted for landscape receptors at 15 years after completion

LANDSCAPE RECEPTOR/RESOURCE	SENSITIVITY	MAGNITUDE OF EFFECT	SIGNIFICANCE OF EFFECT
Ayres End Valleys and Ridges LCA	Medium / High	Low / Medium	Moderate adverse
Landscape elements within the site	Medium / High	Medium	Moderate beneficial

ASSESSMENT OF ENVIRONMENTAL EFFECTS – VISUAL

7.107 The magnitude of change and significance of effect for each visual receptor in the construction phase, at completion and 15 years after completion is detailed at Appendix 7.6. The main effects identified and all other effects summarised below.

Construction phase

7.108 Users of public footpath St Albans City 096 and the permissive path through the site are assessed to experience a high magnitude of change and Major adverse significance of effect during the construction phase, which is significant; and the following receptors are assessed to experience a magnitude of change ranging from medium to high and a Moderate-Major significance of effect, which is significant:

(1) Users of public bridleway Sandridge 009.
(2) Users of Sandridgebury Lane (within the site).
(3) Users of Old Albanians Rugby Club.
(4) Users and residents of Harpenden Road.

7.109 Users of the permissive path, users of public footpath St Albans City 096 and users of Sandridgebury Lane would be moving within the site, where introduced site hoarding, new built form and construction activities across the south and eastern parts of the site may be expected to form an immediately apparent and detrimental change to the foreground of their view.

7.110 Users of public bridleway Sandridge 009 would be seeing construction activities and introduced development in middle-distance views against what is otherwise a predominantly farmed and wooded pre-existing scene.

7.111 Users of Harpenden Road would experience highway changes, construction activities and works associated with the new access, alongside more glimpsed views to the wider development, during part of this phase.

7.112 Users of Old Albanians Rugby Club would be located in proximity to the northern edge of the site where construction activities to deliver fencing and introduced built form in the north west of the proposed development are likely to be prominent for a period south of its main access.

7.113 The remaining visual receptors are not likely to experience significant effects in this phase.

7.114 The magnitude of change for each visual receptor in the construction phase is summarised in Table 32.

Table 32: Magnitude of change predicted for visual receptors during construction phase

VISUAL RECEPTOR/RESOURCE	MAGNITUDE OF CHANGE
Users of public footpath St Albans City 096	Medium / High (local; direct; medium-term; temporary; irreversible)
Users of the permissive path through the site	High (local; direct; medium-term; temporary; irreversible)

VISUAL RECEPTOR/RESOURCE	MAGNITUDE OF CHANGE
Users of public bridleway Sandridge 009	Medium / High (local; direct; medium-term; temporary; irreversible)
Users of public footpath Sandridge 011	Low / Medium (local; direct; medium-term; temporary; irreversible)
Users of rights of way east and northeast of Sandridge	Low (local; direct; medium-term; temporary; irreversible)
Users of Sandridgebury Lane (within the site)	High (local; direct; medium-term; temporary; irreversible)
Users of Sandridgebury Lane (beyond the site)	Low (local; direct; medium-term; temporary; irreversible)
Users of Harpenden Road	High (local; direct; short-term; temporary; irreversible)
Users of the Midland Main Line railway	Medium (local; direct; medium-term; temporary; irreversible)
Users of Old Albanians Rugby Club	High (local; direct; medium-term; temporary; irreversible)
Visitors to the Heartwood Forest	Low / Negligible (local; direct; medium-term; temporary; irreversible)
Visitors to the St Albans Girls School	Low / Medium (local; direct; medium-term; temporary; irreversible)
Visitors to Jersey Farm Park Woodland	Low / Negligible (local; direct; medium-term; temporary; irreversible)
Residents of Harpenden Road	Low / Medium (local; direct; medium-term; temporary; irreversible)
Residents of Childwick Green	Negligible (local; direct; medium-term; temporary; irreversible)

7.115 The significance of effect for each visual receptor in the construction phase is summarised in Table 33.

Table 33: Significance of effect predicted for landscape receptors during construction phase

VISUAL RECEPTOR/RESOURCE	SENSITIVITY	MAGNITUDE OF EFFECT	SIGNIFICANCE OF EFFECT
Users of public footpath St Albans City 096	Medium / High	High	Major adverse
Users of the permissive path through the site	Medium / High	High	Major adverse
Users of public bridleway Sandridge 009	Medium / High	Medium / High	Moderate-Major adverse
Users of public footpath Sandridge 011	Medium / High	Low / Medium	Moderate adverse
Users of rights of way east and northeast of Sandridge	High	Low	Moderate adverse
Users of Sandridgebury Lane (within the site)	Medium	High	Moderate-Major adverse
Users of Sandridgebury Lane (beyond the site)	Medium	Low	Minor-Moderate adverse
Users of Harpenden Road	Medium	High	Moderate-Major adverse
Users of the Midland Main Line railway	Medium	Medium	Moderate adverse
Users of Old Albanians Rugby Club	Medium	High	Moderate-Major adverse
Visitors to the Heartwood Forest	High	Low / Negligible	Minor adverse

VISUAL RECEPTOR/RESOURCE	SENSITIVITY	MAGNITUDE OF EFFECT	SIGNIFICANCE OF EFFECT
Visitors to the St Albans Girls School	Low / Medium	Low / Medium	Minor-Moderate adverse
Visitors to Jersey Farm Park Woodland	High	Low / Negligible	Minor adverse
Residents of Harpenden Road	Medium / High	Low / Medium	Moderate adverse
Residents of Childwick Green	High	Negligible	Minor-Negligible adverse

Operation phase – at completion

7.116 The following visual receptors are assessed to experience a Moderate-Major adverse significance of effect at completion, which is significant:

(1) Users of public footpath St Albans City 096
(2) Users of the permissive path through the site
(3) Users of public bridleway Sandridge 009
(4) Users of Sandridgebury Lane (within the site)
(5) Users of Harpenden Road

7.117 Introduced development would remain prominent in views experienced by users of public footpath St Albans City 096, users of the permissive path and users of Sandridgebury Lane at this stage, but the overall significance of the effect is reduced slightly compared with the construction period because the operational scheme can be expected to be more visually permeable and softened by introduced street trees, shrub planting and scrub and woodland vegetation around its margins (albeit that this vegetation may be at an early stage of establishment).

7.118 Effects on users of public bridleway Sandridge 009, although likely to be reduced slightly compared with the construction phase, may be expected to remain noticeable and detrimental in middle-distance views against what is otherwise a predominantly farmed and wooded pre-existing scene.

7.119 The remaining visual receptors are not likely to experience significant effects in this phase, including users of Sandridgebury Lane, users of Old Albanians Rugby Club and users of Harpenden Road who may either experience slightly reduced changes at this stage or who are judged to be of slightly lower sensitivity to change than those recognised above.

7.120 The magnitude of change for each visual receptor at completion is summarised in Table 34.

Table 34: Magnitude of change predicted for visual receptors at completion

VISUAL RECEPTOR/RESOURCE	MAGNITUDE OF CHANGE
Users of public footpath St Albans City 096	Medium / high (local; direct; medium-term; permanent; irreversible)
Users of the permissive path through the site	High (local; direct; medium-term; permanent; irreversible)
Users of public bridleway Sandridge 009	Medium (local; direct; long-term; permanent; irreversible)
Users of public footpath Sandridge 011	Low (local; direct; long-term; permanent; irreversible)
Users of rights of way east and northeast of Sandridge	Low (local; direct; long-term; permanent; irreversible)
Users of Sandridgebury Lane (within the site)	Medium / high (local; direct; medium-term; permanent; irreversible)

VISUAL RECEPTOR/RESOURCE	MAGNITUDE OF CHANGE
Users of Sandridgebury Lane (beyond the site)	Low / negligible (local; direct; long-term; permanent; irreversible)
Users of Harpenden Road	Medium / high (local; direct; long-term; permanent; irreversible)
Users of the Midland Main Line railway	Medium (local; direct; long-term; permanent; irreversible)
Users of Old Albanians Rugby Club	Medium / high (local; direct; medium-term; permanent; irreversible)
Visitors to the Heartwood Forest	Negligible (local; direct; long-term; permanent; irreversible)
Visitors to the St Albans Girls School	Low (local; direct; long-term; permanent; irreversible)
Visitors to Jersey Farm Park Woodland	Negligible (local; direct; long-term; permanent; irreversible)
Residents of Harpenden Road	Medium (local; direct; long-term; permanent; irreversible)
Residents of Childwick Green	No change

7.121 The significance of effect for each visual receptor at completion is summarised in Table 35.

Table 35: Significance of effect predicted for landscape receptors at completion

VISUAL RECEPTOR/RESOURCE	SENSITIVITY	MAGNITUDE OF EFFECT	SIGNIFICANCE OF EFFECT
Users of public footpath St Albans City 096	Medium / High	Medium / High	Moderate major adverse
Users of the permissive path through the site	Medium / High	High	Moderate major adverse
Users of public bridleway Sandridge 009	Medium / High	Medium	Moderate major adverse
Users of public footpath Sandridge 011	Medium / High	Low	Moderate adverse
Users of rights of way east and northeast of Sandridge	High	Low	Moderate adverse
Users of Sandridgebury Lane (within the site)	Medium	Medium / High	Moderate major adverse
Users of Sandridgebury Lane (beyond the site)	Medium	Low / Negligible	Minor adverse
Users of Harpenden Road	Medium	Medium / High	Moderate adverse
Users of the Midland Main Line railway	Medium	Medium	Moderate adverse
Users of Old Albanians Rugby Club	Medium	Medium / High	Moderate adverse
Visitors to the Heartwood Forest	High	Negligible	Minor negligible adverse
Visitors to the St Albans Girls School	Low / Medium	Low	Minor adverse
Visitors to Jersey Farm Park Woodland	High	Negligible	Minor negligible adverse
Residents of Harpenden Road	Medium / High	Low	Minor moderate adverse
Residents of Childwick Green	High	No effect	No effect

Operation phase – 15 years after completion

7.122 Users of public bridleway Sandridge 009 are assessed to experience a Moderate-Major adverse significance of effect 15 years after completion, which is significant. This effect recognising that, due to landform, the inherent mitigation planting would only be capable of partially screening and softening the appearance of introduced built form and would not materially reduce the change that development would have upon views, which presently overlook a predominantly farmed and wooded landscape.

7.123 The remaining visual receptors are not likely to experience significant effects in this phase, including users of the permissive path and users of public footpath St Albans City 096.

7.124 The magnitude of change for each visual receptor 15 years after completion is summarised in Table 36.

Table 36: Magnitude of change predicted for visual receptors at 15 years after completion

VISUAL RECEPTOR/RESOURCE	MAGNITUDE OF CHANGE
Users of public footpath St Albans City 096	Low / medium (local; direct; long-term; permanent; irreversible)
Users of the permissive path through the site	Medium (local; direct; long-term; permanent; irreversible)
Users of public bridleway Sandridge 009	Low / medium (local; direct; long-term; permanent; irreversible)
Users of public footpath Sandridge 011	Low / negligible (local; direct; long-term; permanent; irreversible)
Users of rights of way east and northeast of Sandridge	Low (local; direct; long-term; permanent; irreversible)
Users of Sandridgebury Lane (within the site)	Medium (local; direct; long-term; permanent; irreversible)
Users of Sandridgebury Lane (beyond the site)	Low / negligible (local; direct; long-term; permanent; irreversible)
Users of the Midland Main Line railway	Low / medium (local; direct; long-term; permanent; irreversible)
Users of Old Albanians Rugby Club	Medium (local; direct; long-term; permanent; irreversible)
Visitors to the Heartwood Forest	Negligible (local; direct; long-term; permanent; irreversible)
Visitors to the St Albans Girls School	Low (local; direct; long-term; permanent; irreversible)
Visitors to Jersey Farm Park Woodland	No change
Users and residents of Harpenden Road	Low / medium (local; direct; long-term; permanent; irreversible)
Residents of Childwick Green	No change

7.125 The significance of effect for each visual receptor at completion is summarised in Table 37.

Table 37: Significance of effect predicted for landscape receptors at 15 years after completion

VISUAL RECEPTOR/RESOURCE	SENSITIVITY	MAGNITUDE OF EFFECT	SIGNIFICANCE OF EFFECT
Users of public footpath St Albans City 096	Medium / High	Low / medium	Moderate adverse
Users of the permissive path through the site	Medium / High	Medium	Moderate adverse
Users of public bridleway Sandridge 009	Medium / High	Medium	Moderate major adverse
Users of public footpath Sandridge 011	Medium / High	Low / negligible	Minor moderate adverse
Users of rights of way east and northeast of Sandridge	High	Low	Moderate adverse
Users of Sandridgebury Lane (within the site)	Medium	Medium	Moderate adverse
Users of Sandridgebury Lane (beyond the site)	Medium	Low / negligible	Minor adverse
Users of Harpenden Road	Medium	Medium	Moderate adverse
Users of the Midland Main Line railway	Medium	Low / medium	Minor moderate adverse
Users of Old Albanians Rugby Club	Medium	Medium	Moderate adverse
Visitors to the Heartwood Forest	High	Negligible	Minor negligible adverse
Visitors to the St Albans Girls School	Low / medium	Low	Minor adverse
Visitors to Jersey Farm Park Woodland	High	Negligible	Minor negligible adverse
Residents of Harpenden Road	Medium / high	Low / medium	Minor moderate adverse
Residents of Childwick Green	High	No effect	No effect

ACTIONABLE MITIGATION

7.126 The assessment of effects determines that one landscape receptor (Ayres End Valleys and Ridges LCA) and six visual receptors (users of public footpath St Albans City 096, users of the permissive path through the site, users of public bridleway Sandridge 009, users of Sandridgebury Lane [within the site], users of Old Albanians Rugby Club and users and residents of Harpenden Road) are likely to experience significant effects within the construction phase; one landscape receptor (Ayres End Valleys and Ridges LCA) and three visual receptors (users of public footpath St Albans City 096, users of the permissive path through the site and users of public bridleway Sandridge 009) are likely to experience significant effects at completion; and one visual receptor (users of public bridleway Sandridge 009) is likely to experience significant effects 15 years after completion.

7.127 It is considered that any further mitigation measures to reduce landscape harm and protect people's visual amenity during construction (i.e. additional to those described in the Inherent and Standard Mitigation section above, which it is assumed would be set out and explained in a CEMP) would not materially alter the magnitude or significance of the effect on these receptors in this phase.

7.128 It is considered also that effects on users of public footpath St Albans City 096, users of the permissive path through the site and users of public bridleway Sandridge 009 at completion cannot be materially reduced without changes to the application parameters and/or introducing other environmental harms (e.g. planting vegetation at a more established stage of growth, which would necessitate additional irrigation activities, etc.).

7.129 It is additionally considered that the residual significant adverse effect on the users of public bridleway Sandridge 009 visual receptor 15 years after completion cannot be further reduced through any actionable mitigation measures. This is because users of this route presently experience elevated, cross-valley and middle-distance views overlooking a predominantly farmed and wooded landscape; and it is considered that the proposed changes could only be materially reduced through the restoration of foreground hedgerow vegetation immediately bordering this route, which is on land outside the control of the applicant.

RESIDUAL EFFECTS

7.130 As no additional mitigation measures are proposed, the residual effects are as determined in the assessment of environmental effects section above.

CUMULATIVE ASSESSMENT

7.131 The proposed development may be experienced in combination with housing proposed at Sewell Park, immediately to the west of the site.

Cumulative landscape effects

7.132 The Sewell Park development would introduce further uncharacteristic engineering and construction activities, and operational built form and uses, which may cause further localised harm to the Ayers End Valleys and Ridges LCA landscape receptor in construction and once operational. The combined effect of the proposed development with this cumulative scheme is assessed to increase the total magnitude of effect 15 years after completion to medium but is assessed not to result in a materially increased significance of effect for this receptor at any of the assessment stages. In the absence of any increased total effects, no additional effects assessment has been carried out.

7.133 The Sewell Park development is assessed not to increase the total magnitude or significance of effect on the landscape elements of the site receptor in either the construction or operational phases. In the absence of any increased total effects, no additional effects assessment has been carried out.

Cumulative visual effects

7.134 The Sewell Park development would be viewed in combination with the proposed development in views experienced by residents of Harpenden Road and some visual receptors within and to the east of the site, including:

(1) Users of public footpath St Albans City 096
(2) Users of the permissive path through the site
(3) Users of public bridleway Sandridge 009
(4) Users of Sandridgebury Lane (within the site)
(5) Users of the Midland Main Line railway

7.135 The Sewell Park development is anticipated to increase the total magnitude of effect on residents of Harpenden Road in the construction phase to medium / high, and at completion and 15 years after completion to medium; in turn, increasing the total significance of effect on this receptor in the construction phase and at completion to Moderate-Major adverse, which is significant; and to increase the total significance of effect on this receptor 15 years after completion to Moderate adverse, which is not significant.

7.136 The Sewell Park development is however assumed to not increase visibility into the site in views experienced by residents of Harpenden Road and is accordingly assessed not to result in any additional magnitude or significance of effect on this receptor. Indeed, this development may be expected to introduce built form which would further reduce visibility to the proposed development in views experienced by residents of Harpenden Road once delivered.

7.137 The Sewell Park development is assessed not to increase the total magnitude or significance of effect on all other visual receptors in either the construction or operational phases, including those within or to the east of the site. In the absence of any increased total effects for these receptors, no additional effects assessment has been carried out.

CONCLUSION

7.138 The proposed development would introduce activities and built form which will cause localised harm to landscape character and detract from the pre-existing scene experienced by those within the surrounding landscape during its construction and at the point of its completion.

7.139 Whilst the effect of these changes are assessed to be not significant for most landscape and visual receptors, the proposed development is assessed to result in a residual significant adverse effect on both the Ayres End Valleys and Ridges LCA and landscape elements of the site landscape receptors and on six visual receptors (users of public footpath St Albans City 096, users of the permissive path through the site, users of public bridleway Sandridge 009, users of Sandridgebury Lane [within the site], users of Old Albanians Rugby Club and users of Harpenden Road) during the construction phase; and on both the Ayres End Valleys and Ridges LCA and landscape elements of the site landscape receptor and on four visual receptors (users of public footpath St Albans City 096, users of the permissive path through the site, users of public bridleway Sandridge 009 and users of Sandridgebury Lane within the site at the point of completion.

7.140 It is considered that the mitigation planting, inherent to the proposals, would not entirely overcome the harm caused by the proposed development to landscape character or people's visual amenity 15 years after completion. These changes are however assessed to deliver a beneficial effect (Moderate beneficial) to the landscape elements within the site receptor at this stage and to reduce the significance of adverse effect to not significant for all landscape and visual receptors other than users of public bridleway Sandridge 009; who presently overlook a predominantly farmed and wooded landscape in elevated, cross-valley and middle-distance views, and the harm upon whom it is considered could only be materially reduced through the restoration of foreground hedgerow vegetation immediately bordering this route, which is on land outside the control of the applicant.

8 Agricultural and soils

8.1 This chapter of the ES concerns the likely significant environmental effects of the proposed development on Agriculture and Soils. It has been compiled by Reading Agricultural Consultants Limited.

8.2 The proposed development will involve the permanent use of agricultural land and will require that the soil resources on the site are subject to disturbance. The potential sensitive receptors are agricultural land, in particular that of best and most versatile ("BMV") quality, and soil resources.

8.3 This chapter is accompanied by Appendix 8.1 comprising a report of detailed Agricultural Land Classification ("ALC") and soil surveys undertaken at the site. The report sets out the detailed methodology for undertaking such surveys and includes mapping of the findings.

ASSESSMENT METHODOLOGY

Study area

8.4 The study area extends to all of the agricultural land within the site, amounting to approximately 40.8ha.

Consultation

8.5 Consultation has been undertaken with the LPA through the EIA scoping process. There are no comments directly relating to agriculture and soil. no further consultation has yet been undertaken. Natural England is the statutory consultee for matters relating to agricultural land and soils. As noted in Natural England's Technical Note 049[i] , where proposals are likely to involve the loss of more than 20ha of BMV agricultural land, consultation is required although only where the development is not in accordance with the provisions of a development plan. This site has been identified in successive versions of the emerging Local Plan at Regulation 18 and Regulation 19 stages.

Legislative / planning policy context

8.6 Paragraph 180 of the National Planning Policy Framework identifies that planning policies and decisions should contribute to and enhance the natural and local environment by, amongst other matters, protecting and enhancing soils (in a manner commensurate with their statutory status or identified quality in the development plan). It also advises that the intrinsic character and beauty of the countryside, and the wider benefits from natural capital and ecosystem services should be recognised in policies and decisions, including the economic and other benefits of best and most versatile agricultural land.

8.7 Paragraph 181 indicates that plans should allocate land with the least environmental or amenity value, where consistent with other policies in the NPPF, with footnote 62 advising that where significant development of agricultural land is demonstrated to be necessary, areas of poorer quality land should be preferred to those of a higher quality, and that the availability of agricultural land used for food production should be considered, alongside the other policies in the NPPF, when deciding which sites are most appropriate for development.

8.8 The Planning Practice Guidance ("PPG")[22] is a live online resource that explains how planning can take account of the quality of agricultural land and safeguard soils. Reference is made in Paragraph: 001

[22] Department for Levelling Up, Housing and Communities and Ministry of Housing, Communities and Local Government (2024). Planning Practice Guidance – Natural Environment. https://www.gov.uk/guidance/natural-environment

Reference ID: 8-001-20190721, Revision date: 21 07 2019, to the ALC system which assesses the quality of farmland to enable informed choices to be made about its future use within the planning system.

8.9 Planning policies and decisions should take account of the economic and other benefits of the BMV agricultural land. The guidance also confirms that Natural England has a statutory role in advising local planning authorities about agricultural land quality issues.

8.10 Saved Policy 102 of the District Local Plan Review 1994 notes that development resulting in the loss of agricultural land in Grades 1, 2 or 3a will normally be refused, unless there is an overriding need for the development and there is no reasonable, lower quality alternative.

8.11 Policy NEB 9 of the Draft Local Plan for St Albans reflects the 1994 policy, but further notes that where major development is proposed on agricultural land and is not a site allocation, a survey including an assessment of ALC grading should be undertaken and approved by DEFRA or an independent expert. In that same consultation document the application site is identified as part of the North St Albans Broad Location.

Assessment of process

8.12 Agricultural land in England and Wales is graded between 1 and 5, depending on the extent to which physical or chemical characteristics impose long-term limitations on agricultural use. The principal physical factors influencing grading are climate, site conditions and soil which, together with interactions between them, form the basis for classifying land into one of the five grades.

8.13 Grade 1 land is excellent quality agricultural land with very minor or no limitations to agricultural use. Grade 2 is very good quality agricultural land, with minor limitations which affect crop yield, cultivations or harvesting. Grade 3 land has moderate limitations which affect the choice of crops, timing and type of cultivation, harvesting or the level of yield, and is subdivided into Subgrade 3a (good quality land) and Subgrade 3b (moderate quality land). Grade 4 land is poor quality agricultural land with severe limitations which significantly restrict the range of crops and/or level of yields. Grade 5 is very poor quality land, with very severe limitations which restrict use to permanent pasture or rough grazing.

8.14 Land that is classified as Grades 1, 2 and 3a in the ALC system is defined as BMV agricultural land.

Assessment criteria

8.15 The sensitivity of agricultural land is commensurate with the ALC grade and has regard to the IEMA Guidance on Land and Soils in EIA[23]. The sensitivity of the soil resource reflects its textural characteristics and its susceptibility to the effects of handling during construction and the re-instatement of land.

8.16 The criteria for establishing sensitivity are set out in Table 38.

8.17 The thresholds for determining the magnitude of change have been derived taking into account the statutory consultation procedures with Natural England for development involving agricultural land, as set out in the Town and Country Planning (Development Management Procedure) (England) Order 2015, Schedule 4. This requires local planning authorities to consult Natural England for developments that do not accord with a development plan and involve the loss of 20ha or more of BMV agricultural land.

[23] IEMA (2022). A New Perspective on Land and Soil in Environmental Impact Assessment

Table 38: Criteria for assessing the sensitivity of agricultural and soils resources

SENSITIVITY	CRITERIA	
	AGRICULTURAL LAND	SOIL RESOURCES
High	Grade 1 and Grade 2	Soils with high clay and silt fractions (clays, silty clays, sandy clays, heavy silty clay loams and heavy clay loams); peaty soils
Medium	Subgrade 3a and Subgrade 3b	Silty loams, medium silty clay loams, medium clay loams and sandy clay loams
Low	Grade 4 and Grade 5	Soils with a high sand fraction (sands, loamy sands, sandy loams and sandy silt loams)

8.18 The magnitude of change on the soil resource is assessed according to the degree to which disturbed soil resources can continue to fulfil one or more of the primary soil functions of: the production of food and biomass and the provision of raw materials; the storage, filtration and cycling of water, carbon and nitrogen in the biosphere; the support of ecological habitats and biodiversity; support for the landscape; the protection of cultural heritage; and the provision of a platform for human activities, such as construction and recreation. The criteria are set out in Table 39.

Table 39: Criteria for determining the magnitude of change on agricultural and soils resources

MAGNITUDE	CRITERIA	
	AGRICULTURAL LAND	SOIL RESOURCES
High	Development would directly lead to the loss of over 50ha of agricultural land	The soil displaced from development is unable to fulfil one or more of the primary soils functions
Medium	Development would directly lead to the loss of between 20ha and 50ha of agricultural land	The soil displaced from development mostly fulfils the primary soil functions off-site or has a reduced capacity to fulfil the primary functions on site
Low	Development would directly lead to the loss of between 5ha and 20ha of agricultural land	The soil displaced from development mostly fulfils the primary soil functions on-site
None	Development would directly lead to the loss of less than 5ha of agricultural land	The soil retains its existing functions on-site

8.19 The significance of the effect is then determined according to the standard significance matrix, set out in Table 40.

Table 40: Significance matrix for agricultural and soils resources

SENSITIVITY OF RECEPTOR	MAGNITUDE OF CHANGE			
	HIGH	MEDIUM	LOW	NONE
High	Major or substantial	Major/Moderate	Moderate/Minor	Negligible
Medium	Major or substantial	Moderate	Minor	Negligible
Low	Moderate	Minor	Negligible	Negligible

Sources of information

8.20 Most of the site was surveyed in 1994[24]. The existing reports and accompanying maps have been used to form the basis of this assessment. The land not included in the previous survey work was subject to a detailed soil and ALC survey in July 2022.

Assumptions

8.21 The assessment has relied upon the results of some existing survey data which has not been repeated and is assumed to be an accurate account of the site conditions.

Assessment limitations

8.22 There are no limitations to the assessment of effects on agricultural land and soils.

BASELINE CONDITIONS

8.23 Two contrasting soil types are present at the site with differing limitations to the ALC.

8.24 The most prevalent soil type includes moderately stony, heavy clay loam topsoil overlying similar upper subsoils and passing to slowly permeable clay subsoil. The soil profiles are in WC II and are limited by wetness to Subgrade 3a. Topsoil stoniness is also commonly a limitation to the ALC, mostly also to Subgrade 3a but in the north-east to Subgrade 3b.

8.25 The secondary soil type is present in the south and south-east of the site and comprises medium sandy loam topsoil over loamy medium sand and passing to medium sand. The topsoil stone content increases eastwards such that profiles of this type in the west are limited most by droughtiness to Subgrade 3a and those in the east are limited by stone to Subgrade 3b.

8.26 The areas of each ALC grade present are given in Table 41.

Table 41: Agricultural Land Classification across the application site

GRADE	DEFINITION	HECTARES	PROPORTION OF SITE
Subgrade 3a	Good quality	31.7	64
Subgrade 3b	Moderate quality	9.1	18
Non-agricultural		8.9	18
Total		49.7	100

8.27 Most of the agricultural land at the site is Subgrade 3a quality which is BMV land. The most prevalent soil type is heavy clay loam and clay. The sensitivity of each of these resources is given in Table 42.

Table 42: The sensitivity of agricultural and soils within the application site

ENVIRONMENTAL RECEPTOR/RESOURCE	SENSITIVITY
BMV agricultural land in Subgrade 3a	Medium
Heavy clay loam and clay soil texture	High

[24] ADAS (1994). Agricultural Land Classification and Statement of Physical Characteristics – Land at Cheapside Farm, Sadrindgebury Lane, St Albans, Hertfordshire. Ref. 024/94

INHERENT AND STANDARD MITIGATION

8.28 Inherent mitigation incorporated into the scheme design mostly relates to the directing of built aspects of development toward the lower quality land available. However, as 64% of the whole Site (or 78% of the agricultural land) is in Subgrade 3a, there is little opportunity to avoid the use of BMV land. The northernmost field parcel proposed for the relocation of sports pitches is primarily BMV and would not be subject to irreversible built development.

ASSESSMENT OF ENVIRONMENTAL EFFECTS

8.29 All of the potential effects on agricultural land and soils will occur during the construction phase of the proposed development.

8.30 The proposed development would require the permanent and irreversible use of 40.8ha of agricultural land, of which 31.7ha is Subgrade 3a and 9.1ha is Subgrade 3b.

8.31 Prior to the implementation of actionable mitigation, the soil resource could be subject to damage by compaction or smearing by machinery which would result in a loss of structure, by mixing and stockpiling incompatible textures, or by mixing topsoil and subsoil resources. Soils that are stockpiled when wet can become anaerobic causing further reduction in soil health. The effect would be long-term but likely ultimately reversible with careful management.

8.32 The magnitude of change to agricultural land and soil receptors is set out in Table 43.

Table 43: Magnitude of change experienced by agricultural and soils resources

ENVIRONMENTAL RECEPTOR/RESOURCE	MAGNITUDE OF CHANGE
Agricultural land, including that of BMV quality in Subgrade 3a	Medium
Heavy clay loam and clay soil texture	High

8.33 The significance of the effects of the proposed development on Agricultural Land and Soils receptors is determined according to the significance matrix and summarised in Table 44.

Table 44: Significance of effects on agricultural and soils resources

ENVIRONMENTAL RECEPTOR/RESOURCE	SENSITIVITY	MAGNITUDE OF EFFECT	SIGNIFICANCE OF EFFECT
Agricultural land, including that of BMV quality in Subgrade 3a	Medium	Medium	Moderate Adverse
Heavy clay loam and clay soil texture	High	High	Major or substantial Adverse

ACTIONABLE MITIGATION

8.34 There are no universally available methods to mitigate the direct loss of agricultural land.

8.35 Mitigation measures to minimise potentially significant adverse effects on soils relate to recording within a Soil Resources Management Plan (“SRMP”) the existing soil resources of the site and ensuring that they are handled, stored and replaced according to good practice as set out in the DEFRA

Construction Code of Practice for the Sustainable Use of Soils[25]. In this way, soils that are reused on the site will be used for their most suitable purposes in the detailed design and will be able to continue to fulfil their various ecosystem functions.

8.36 The SRMP will confirm the most appropriate re-use for the topsoils within the site and aim to re-use as much of the displaced topsoil on-site as is possible in the detailed design of the proposed development.

RESIDUAL EFFECTS

8.37 With no mitigation measures available, the residual effect on agricultural land remains unchanged.

8.38 Implementation of a SRMP would reduce the magnitude of change to soil resources to low. The residual effect on soil resources would therefore be reduced to moderate/minor adverse and continues to be a long-term but temporary and reversible effect. The residual effects are summarised in Table 45.

Table 45: Significance of residual effects on agricultural and soils resources

ENVIRONMENTAL RECEPTOR/RESOURCE	SIGNIFICANCE OF RESIDUAL EFFECT
Agricultural land, including that of BMV quality in Subgrade 3a	Moderate adverse
Heavy clay loam and clay soil texture	Moderate/minor adverse

CUMULATIVE IMPACT

8.39 The land identified as Sewell Park is also undeveloped land but has not been subject to the same level of agricultural activity as the application site. Its development will result in the loss of undeveloped land and soils but the combined effects is not considered to be of any greater significance than that assessed for the application site.

CONCLUSION

8.40 The ALC and soil surveys have classified the site as mostly Subgrade 3a quality with a smaller area of Subgrade 3b. Agricultural land of Subgrade 3a quality is within the bracket of BMV and is a resource of medium sensitivity. The loss of 40.8ha of agricultural land, of which 31.7ha is Subgrade 3a and 9.1ha is Subgrade 3b, is a medium magnitude of change.

8.41 There are no measures to mitigate the loss of agricultural land. The residual effect is a moderate adverse effect. This is significant in EIA terms.

8.42 The main soil resource comprises heavy clay loam and clay textures which is a resource of high sensitivity. With the implementation of a SRMP to mitigate the effects of the proposed development on soil resources, the residual magnitude of change is low, resulting in an overall moderate/minor adverse effect on soil resources. This is not significant in EIA terms.

[25] Department of Environment, Food and Rural Affairs (Defra) (2009). Construction Code of Practice for the Sustainable Use of Soils on Construction Sites

9 Heritage and archaeology

9.1 This chapter of the ES concerns the likely significant environmental effects of the proposed development on archaeology and heritage assets. This chapter of the ES has been compiled by Orion Heritage.

9.2 The historic environment includes a wide range of features resulting from human intervention in the landscape, varying in scope from buried archaeological remains, to late 20th century industrial and military structures. It can be broadly divided into the following categories:

(1) Archaeology, which comprises scheduled monuments ("SMs") and non-designated archaeological heritage assets; and

(2) Built Heritage, which comprises listed buildings, non-designated buildings of heritage interest, registered parks and gardens, conservation areas, historic battlefields and World Heritage Sites ("WHS").

9.3 This assessment is informed by an historic environment desk-based assessment ("HEDBA") within which are the results of an archaeological fieldwalking survey undertaken in 2019 (Appendix 9.1) and a geophysical survey undertaken in 2024 (Appendix 9.2).

ASSESSMENT METHODOLOGY

9.4 This section describes the assessment methodology employed in respect of this environmental topic.

Study area

9.5 As there are no predefined parameters for the setting of study areas, this has been defined using professional judgement and experience of potential significant direct and indirect effects likely to arise from the proposed development.

9.6 For both the archaeological and heritage asset setting study, a radius of 1km from the edge of the site has been used to identify designated and non-designated archaeological assets which might be directly or indirectly impacted by the proposed development and inform the potential for previously unrecorded archaeological remains. However, the study area was extended to include all the listed buildings within the Childwickbury Conservation Area.

Consultation

9.7 During the preparation of this assessment, consultation has been held with SACDC and their archaeological advisors *Place Services*, which has assisted in defining the assessment processes at this stage of the project. As a result of pre-determination discussions with Place Services (Richard Havis, July 2024), a geophysical survey of the site was undertaken. Following completion of this work, further discussions with Place Services were undertaken (October 2024) the outcome of which is an agreement that no further pre-determination evaluation is necessary. It has been agreed that a scheme of archaeological works will be secured by a condition attached to outline panning permission. The first stage of this will be site wide trenching. Should this work reveal archaeological remains, mitigation excavation will be undertaken, the scope of which will be agreed with Place Services and SACDC would be undertaken as a condition of planning along with associated mitigation works. Planning and Building Control at St Albans City and District Council have requested that the assessment of designated assets within the wider area of the site are included. Also to be included are potential effects from lighting/noise as well as visual effects. Legislative / planning policy context.

9.8 The following legislation has informed the assessment of effects within this chapter:

(1) Ancient Monuments & Archaeological Areas Act 197926; and

(2) Planning (Listed Building and Conservation Areas) Act 199027

9.9 The following policy has also informed the assessment of effects within this chapter:

(1) National Planning Policy Framework;

(2) National Planning Practice Guidance;

(3) St Albans District Local Plan Review (1994): Policy 109: Scheduled Ancient Monuments; Policy 110: Archaeological Sites for Local Preservation; Policy 111: Archaeological Sites where planning permission may be subject to a recording condition.

9.10 Relevant legislation and planning policy is discussed in Section 2 of the HEDBA at Appendix 9.1.

Assessment of process

9.11 The assessment process involves the production of a HEDBA contained within Appendix 9.1 which includes the results of a fieldwalking survey.

9.12 The results of a geophysical survey are contained within Appendix 9.2. The geophysical survey was undertaken in accordance with the Chartered Institute for Archaeology's Standards and Guidelines for archaeological geophysical survey[28]. Archaeological geophysical survey uses non-intrusive and non-destructive techniques to determine the presence or absence of anomalies likely to be caused by archaeological features, structures or deposits, as far as reasonably possible, within a specified area or site on land, in the inter-tidal zone or underwater. Geophysical survey determines the presence of anomalies of archaeological potential through measurement of one or more physical properties of the subsurface. Geophysical survey of existing playing fields was not possible due to access; however, due to the modern, recreational use of this land geophysical survey is also not considered likely to have good quality results.

9.13 The first step in the assessment process is the identification of known and potential cultural heritage receptors that may be affected by the proposed development. Heritage receptors are either designated (scheduled monuments, conservation area, listed buildings, registered parks and gardens or registered battlefields) which are identified on the National Heritage List for England (NHLE) or areas of importance identified in local planning policy, or non-designated heritage assets.

9.14 As defined in the NPPG "Non-designated heritage assets are buildings, monuments, sites, places, areas or landscapes identified by plan-making bodies as having a degree of heritage significance meriting consideration in planning decisions, but which do not meet the criteria for designated heritage assets."

9.15 Non-designated heritage assets can comprise identified heritage receptors, for example finds or features recorded in the Historic Environment Record or locally listed buildings recorded in local planning policy. The potential for previously unrecorded heritage assets is also considered, for example previously unrecorded archaeological remains or previously un-assessed built heritage asset.

9.16 Not all features recorded on Historic Environment Records are non-designated assets. As outlined in Managing Significance in Decision-Taking in the Historic Environment Historic Environment Records includes *"assets that are known to have been demolished or destroyed or known only from*

[26] Ancient Monuments & Archaeological Areas Act, (1979)

[27] Planning (Listed Building and Conservation Areas) Act, (1990)

[28] Standard and guidance for archaeological geophysical survey (2014) Chartered Institute for Archaeologists

antiquarian sources"; they are no longer physically present. Similarly, there is potential for non-designated heritage assets that are not recorded on the Historic Environment Record or recorded in local planning policy to be present. Such remains may include previous unrecorded sub-surface remains, landscape features or buildings identified through an appraisal of sources or identification through a site visit.

9.17 In terms of non-designated assets, the NPPG states that there are two categories of non-designated sites of archaeological interest:

(1) Those that are demonstrably of equivalent significance to scheduled monuments and are therefore considered subject to the same policies as those for designated heritage assets...

(1) Other non-designated heritage assets of archaeological interest.

9.18 The value / significance of a non-designated heritage asset may change following assessment and evaluation prior to a planning decision and move from the second to the first category.

Assessment criteria

Assessing heritage significance and sensitivity

9.19 The significance of a heritage asset is defined in the NPPF as "*the value of a heritage asset to this and future generations because of its heritage interest. That interest may be archaeological, architectural, artistic or historic. Significance derives not only from a heritage asset's physical presence, but also from its setting.*"[29] In the case of many heritage assets their importance has already been established through the designation (i.e. scheduling, listing and register) processes applied by Historic England ("HistE").

9.20 In order to assess the heritage significance of previously unrecorded or non-designated heritage assets, the criteria used by the Department of Culture, Media, and Sports publication, 'Principles for Selection of Listed Buildings'[30] and the Scheduled Monuments Policy Statements published by the same body[31], are used. The criteria for establishing significance of heritage assets for this assessment are presented in Table 46 below.

Table 46: Determining the significance of heritage assets

HERITAGE SIGNIFCANCE	DESCRIPTION
International	Archaeological sites or monuments of international importance, including World Heritage Sites. Structures and buildings inscribed as of universal importance as World Heritage Sites. Other buildings or structures of recognised international importance.
National	Monuments scheduled under the Ancient Monuments and Archaeological Areas Act 1979, or archaeological sites and remains of comparable quality, assessed with reference to the DCMS's principles of selection for scheduled monuments (DCMS 2013). Listed Buildings. Conservation Areas. Non-designated built assets of national importance, assessed with reference to the Secretary of State's published Principles of Selection for Listing Buildings[32].

[29] Scheduled Monuments. Identifying, protecting, conserving and investigating nationally important archaeological sites under the Ancient Monuments and Archaeological Areas Act 1979, (2010), Department of Culture, Media, and Sports

[30] Principles of selection for listed buildings (2018), Department of Culture, Media, and Sports

[31] Scheduled Monuments Policy Statements, (2013), Department of Culture, Media, and Sports

[32] Scheduled Monuments. Identifying, protecting, conserving and investigating nationally important archaeological sites under the Ancient Monuments and Archaeological Areas Act 1979, (2010), Department of Culture, Media, and Sports

HERITAGE SIGNIFCANCE	DESCRIPTION
Regional / county	Archaeological sites and remains which, while not of national importance, score well against most of the DCMS's principles of selection for scheduled monuments[33].
Local	Archaeological sites and remains which, while not of national importance, score well against most of the DCMS's principles of selection for scheduled monuments[34].
None	Areas in which investigative techniques have produced negligible or only minimal evidence for archaeological remains, or where previous large-scale disturbance or removal of deposits can be demonstrated.

9.21 Significance has been assigned to effects relative to the heritage significance, its sensitivity to change and the magnitude of impact in accordance with best practice.

9.22 The sensitivity of a heritage receptor / resource is determined by evaluating a receptors susceptibility to change and heritage significance. For direct physical impacts to below ground archaeological remains or built heritage assets this is assessed in terms of potential reduction of heritage significance through the physical impact of a monument or building.

9.23 For indirect impacts to the setting of heritage assets, the heritage significance of an asset is not the same as its sensitivity to change35. Thus, in determining effects upon the setting of assets by a proposed development, both heritage significance and sensitivity to changes to setting need to be considered. Factors considered when assessing sensitivity to indirect change include, but are not limited to, heritage significance, condition, type and period of asset and landscape positioning. The assessment of settings impact following the methodology set out in the Historic Environment Good Practice Advice in Planning Note 3, The Setting of Heritage Assets.

9.24 The criteria for assessing sensitivity to change is set out in Table 47 below.

Table 47: Criteria for determining sensitivity of heritage assets

SENSITIVITY	RECEPTOR
High	The receptor/resource has little ability to absorb change without fundamentally altering its present international or national heritage significance; or The application site(s) make a high contribution to the setting / heritage significance of a designated heritage asset.
Moderate	The receptor/resource has moderate capacity to absorb change without significantly altering its present regional heritage significance; or The application site(s) make a moderate contribution to the setting / heritage significance of a designated heritage asset.
Low	The receptor/resource is tolerant of change without detriment to its heritage significance, is of low or local heritage significance; or The study site makes a minor contribution to the setting of a designated heritage asset.

[33] Scheduled Monuments Policy Statements, (2013), Department of Culture, Media, and Sports

[34] Scheduled Monuments Policy Statements, (2013), Department of Culture, Media, and Sports

[35] Historic Environment Good Practice Advice in Planning Note 3: The Setting of Heritage Assets, (2017), Historic England

Assessing magnitude of change

9.25 The nature and likelihood of the impacts of the proposed development is assessed on archaeological and heritage features against clearly defined criteria.

9.26 Significance has been assigned to effects relative to the heritage significance, its sensitivity to change and the magnitude of impact in accordance with best practice.

9.27 Archaeological and built heritage resources are susceptible to a range of direct impacts during site preparation as well as construction related activities, including:

(1) Site clearance / site preparation activities that disturb archaeological remains;

(2) Demolition or alteration of designated and non-designated built cultural heritage assets;

(3) Excavation that extends into archaeological sequences, for example remediation excavations, deep foundations, basements or re-landscaping (for example attenuation ponds) resulting in the removal of the resource;

(4) Piling activities resulting in disturbance and fragmentation of the archaeological resource; and

(5) Dewatering activities resulting in desiccation of waterlogged remains and deposits.

9.28 Indirect impacts to heritage receptors primarily relate to changes to the setting of a Listed Building / Conservation Area / Scheduled Monument / non-designated heritage asset.

9.29 The magnitude of the impact is a product of the extent of development impact on an asset. Impacts are rated as high, medium, low and negligible/neutral. Impacts can be direct or indirect, adverse or beneficial. The criteria for assessing the magnitude of impact are set out in Table 48 below.

Table 48: Criteria for determining magnitude of change to heritage assets

MAGNITUDE	DIRECT IMPACTS	INDIRECT IMPACTS
High adverse	Demolition of built heritage assets or demolition within a Conservation Area. Complete removal of an archaeological site.	Radical transformation of the setting of an archaeological monument. Substantially harmful change to the significance of a built heritage asset or Conservation Area due to a change in setting.
Medium adverse	Harmful alteration (but not demolition) of a built heritage asset or alterations to a building in a Conservation Area. Removal of a major part of an archaeological site and loss of research potential / significance.	Less than substantial harm to the significance of a built heritage asset or Conservation Area due to a change in setting. Partial transformation of the significance of an archaeological site e.g. the introduction of significant noise or vibration levels to an archaeological monument leading to changes to amenity use, accessibility or appreciation of an archaeological site.
Low adverse	Alterations to a built heritage asset or Conservation Area resulting in minor harm. Removal of an archaeological site where a minor part of its total area is removed but the site retains significant future research potential.	Minor harm to the significance of an archaeological monument or built heritage asset or Conservation Area due to a change in setting.
Negligible/neutral	Negligible impact from changes in use, amenity or access. Negligible direct impact to the built heritage asset or Conservation Area.	Negligible perceptible change to the significance of a building, archaeological site or Conservation Area due to a change in setting.

MAGNITUDE	DIRECT IMPACTS	INDIRECT IMPACTS
Low beneficial	Alterations to a built heritage asset or Conservation Area resulting in minor beneficial impacts. Land use change resulting in improved conditions for the protection of archaeological remains.	Minor enhancement to the setting of a built heritage asset or Conservation Area. Decrease in visual or noise intrusion on the setting of a building, archaeological site or monument.
Medium beneficial	Alterations to a built heritage asset or Conservation Area resulting in minor beneficial impacts. Land use change resulting in improved conditions for the protection of archaeological remains.	Significant reduction or removal of visual or noise intrusion on the setting of a building, archaeological site or monument. Improvement of the wider landscape setting of a built heritage asset, Conservation Area, archaeological site or monument. Improvement of the cultural heritage amenity, access or use of a built heritage asset, archaeological site or monument. Moderate enhancement to the setting of the built heritage asset and Conservation Area.
High beneficial	Arrest of physical damage or decay to a built heritage asset or structure. Alteration to a built heritage asset or Conservation Area resulting in significant beneficial impact.	Significant enhancement to the setting of a built heritage asset. Conservation Area or archaeological site, its cultural heritage amenity and access or use.

9.30 Table 48 primarily deals with visual factors affecting setting. Whilst the importance of visual elements of setting (e.g. views, intervisibility, prominence etc.) are clear, it is also acknowledged that there are other non-visual factors which could potentially result in impacts to setting. Such factors could be other sensory factors (e.g., noise or odour) or could be associative. In coming to a conclusion about magnitude of change upon setting, this assessment makes reference to traffic, noise, air quality, and townscape and visual assessments, reported in the ES, as appropriate.

Significance of effect

9.31 The significance of the effect of the proposed development on archaeological and heritage assets is determined by the heritage significance of the asset and the magnitude of impact to the asset. Table 49 below presents a matrix that demonstrates how the significance of effect is established.

Table 49: Criteria for determining significance of effects on heritage assets

SENSITIVITY OF HERITAGE ASSET		MAGNITUDE OF IMPACT			
		HIGH	MEDIUM	LOW	NEGLIGIBLE
	High	Major	Major	Moderate - Minor	Negligible
	Moderate	Major - Moderate	Moderate - Minor	Minor	Negligible
	Low	Moderate - Minor	Minor	Minor- Negligible	Negligible
	Negligible	Negligible	Negligible	Negligible	Negligible

9.32 Effects of moderate or above are considered 'significant', unless otherwise stated, whilst minor and negligible impacts are not significant, although the levels of effect could potentially be positive,

neutral, or negative. However, professional judgement is also used in considering the significance of effects.

9.33 The judgement of the significance of effects takes into consideration the impact on the heritage asset's heritage significance (as defined in Annex 2 of the NPPF). As part of this assessment, the impact on the contribution that the setting of a heritage asset makes to its significance is also considered. The nature of the contribution that the setting of an asset makes to its heritage significance varies from asset to asset (i.e., the setting of some assets have a greater contribution to the significance and vice versa). Consequently, where there are effects from a development on the setting of an asset that has only a limited contribution to the significance of that asset, the effect on the significance of the asset itself may be very limited or even potentially non-existent. Where a heritage asset has a setting that has a large contribution to the significance of that asset, effects on the significance of the asset itself will be greater.

Sources of information

9.34 The following data sources were used in the compilation of the baseline data:

(1) Hertfordshire Historic Environment Record ("HHER");
(2) Hertfordshire Archives and Local Studies ("HALS");
(3) The National Heritage List for England ("NHLE") held by Historic England;
(4) The National Archives ("TNA");
(5) The British Library ("BL")
(6) Pastscape; and
(7) Areas of importance identified in local planning policy (conservation areas, archaeological priority areas).

9.35 Archaeological investigations undertaken to inform the assessment include:

(1) Site inspection and settings assessment;
(2) Fieldwalking (CA 2019; Appendix 9.1); and
(3) Geophysical Survey (Sumo 2024; Appendix 9.2).

Assumptions

9.36 For the purpose of this assessment, it is assumed that any ground disturbance has the potential to impact the archaeological horizon, if present. This includes currently unquantified ground disturbance associated with foundation, utilities, drainage construction related activities and landscaping.

Assessment limitations

9.37 This assessment is based upon data obtained from publicly accessible archives as described in paragraph 9.34. Data was received from Hertfordshire Historic Environment Record in May 2024 and downloaded from the HE website in May 2024.

BASELINE CONDITIONS

9.38 The site does not contain any designated heritage assets (archaeological or built heritage).

9.39 Two scheduled monuments are located within the 1km study area: Batch Wood, Moated Manorial Site (NHLE 1012407), 800m west of the study site; and the Iron Age Territorial Boundary known as Beech Bottom Dyke (NHLE 1019136), c. 250m south of the study site.

9.40 A total of twenty grade II listed buildings and one Conservation Area are recorded within the 1km study area. This includes ten listed buildings at Childwick Green (including Childwick Lodge), c. 850m north-northwest of the study site, eight listed buildings at Childwick Bury House c. 900m north-west

of the study site and two listed buildings associated with Sandridgebury, c. 700m east of the study site boundary.

9.41 Whilst the 1km study area includes parts of Childwickbury Conservation Area, Childwick Green and Childwick Bury Manor, the study area was extended to include all the designated heritage assets within these groups.

9.42 The HHER records the following features adjacent the study site boundary:

(1) Railway Bridge Sandridgebury Lane (HHER 5585). This is of some local heritage significance but is not listed or locally listed.

9.43 The site does not lie within a Hertfordshire County Council Archaeological Alert Area. The closest Archaeological Alert Area to the study site lies 30m east of the study site in an area where Roman tile has been recovered (HHER 656).

9.44 The site has been subject to fieldwalking survey by Cotswold Archaeology in 2019. The results of this survey are included as an appendix to the HEBDA. The survey recorded 70 sherds of pottery, eight fragments of iron and 2265 fragments of undiagnostic ceramic building material. No concentrations of material likely to be indicative of, or derived from sub-surface features were identified, and no lithics were recovered to suggest a continuation of Neolithic and Bronze Age flint scatters previously identified to the west of the site, at the former Cheapside Farm. Recovered flint comprised just four pieces, all subsequently determined to be unworked / of natural origin.

9.45 Only two sherds of pottery, one sherd of locally produced Roman pottery, and a single sherd of Midlands purple ware, of broad late 14th to 16th century date, were of archaeological significance. Both of these sherds are likely to have derived from manuring processes. The remaining pottery was of later post-medieval and modern date (18th to 20th century) and, as with the other material recovered, is again almost certainly derived from manuring processes (CA 2019; Appendix 9.1).

9.46 A magnetometer survey of the site was undertaken in August/September 2024 (Sumo 2024). The survey recorded no magnetic responses that could be interpreted as being of definite archaeological interest. Responses of uncertain origin were detected; while archaeological origins cannot be entirely discounted for some of the anomalies, the majority are probably due to natural and agricultural processes. Geological and pedological responses dominated the results and include former palaeochannels meandering across the site. Two service pipes have been marked in the west of Area 3 and ferrous responses plus zones of magnetic disturbance in Area 2 are due to sports pitches.

9.47 The HEDBA includes a detailed historical and archaeological baseline. The potential for below ground archaeological remains within the site is informed by an assessment of known archaeological remains in the vicinity of the site, fieldwalking survey (CA 2019; Appendix B) and geophysical survey (SUMO 2024). The estimated potential for finds and features within the Application site is as follows:

9.48 Low-medium potential for prehistoric evidence. An assemblage of Neolithic worked flint was recovered from Cheapside Farm, 250m north of the study site which suggests the possible presence of Neolithic settlement in the vicinity. A review of available sources has not indicated the presence of such a site within the study area. However, remains of prehistoric date cannot be ruled out as systematic archaeological investigation in the area is relatively limited. Similarly, the study site lies c. 250m north of the scheduled Beech Bottom Dyke and evidence of Iron Age agricultural activity / land-management cannot be ruled out entirely. It is noted that no evidence of in situ prehistoric occupation was recorded in the recent geophysical survey. As such, based on available evidence well-preserved deposits of a level that would warrant preservation in situ are not expected. The significance or sensitivity of the prehistoric resource is considered likely to be local or low. Potential effects on the nationally significant scheduled Iron Age territorial boundary known as Beech Bottom Dyke (NHLE 1019136) in relation to the proposed travel improvements are considered below.

9.49 Low – medium potential for Romano-British occupation in the south-eastern part of the site, c. 100m north of the Roman road from Verulamium to Braughing. The main Application site lies c. 1.8km north of the Roman town of Verulamium, the scheduled remains of which are in the southwest of the modern city of St Albans. The line of the Roman road and the surrounding field is covered by an Archaeological Alert Area. An assemblage of Roman tile has been recovered within this locality which may suggest the presence of associated Roman buildings (HHER 656). It is noted that no evidence of Romano-British occupation was identified in the recent geophysical survey. Based on available evidence well-preserved deposits of a level that would warrant preservation in situ are not expected. The significance or sensitivity of the Romano-British resource is considered likely to be local or low.

9.50 Low potential for early medieval, medieval finds and features across the study site. The site forms part of the agricultural hinterland of known historic settlement, as such finds or features from the early medieval, medieval and post-medieval periods are likely to comprise evidence of agricultural activity only. This is supported by the results of recent geophysical survey which recorded no evidence of significant in situ historic settlement within the site. The significance or sensitivity of the below ground historic resource is considered likely to be local or low.

9.51 The proposed development includes off site transport inclusions to the south of the main site. The proposed works include transport improvements where the scheduled monument crosses Valley Road and the Ancient Briton junction. These works would require groundworks (re-surfacing) within the limits of the scheduled monument and Scheduled Monument Consent will be required for these works. An additional site walkover was undertaken in September 2024 to assess the ground conditions and setting of the monument at these locations. The results of this assessment are included in the HEDBA.

9.52 In summary, the proposed foot/cycle path extension lies immediately adjacent to the existing footpath. This area is consistently at the flattest point within the corridor currently utilised for utilities. No additional earthworks or features associated with the scheduled monument were noted. There is potential for buried archaeological remains associated with the scheduled monument below the existing infrastructure / grass verge. Changes to the existing topography / profile of the grass verge has the potential to reduce the legibility of the monument at this location and harm its significance.

9.53 The sensitivity of various heritage assets is summarised in Table 50.

Table 50: Summary of sensitivity of heritage assets

HERITAGE ASSET	SENSITIVITY
Potential non-designated below ground prehistoric and Romano-British archaeological remains	The sensitivity of the potential archaeological remains is considered **low – moderate** based on anticipated condition and heritage significance
Iron Age territorial boundary known as Beech Bottom Dyke (NHLE 1019136)	This nationally significant archaeological asset is located adjacent to planned off-site travel improvements at Ancient Briton. It is considered to have **high sensitivity**: the receptor/resource has little ability to absorb change without fundamentally altering its present international or national heritage significance

INHERENT AND STANDARD MITIGATION

9.54 No inherent mitigation measures in relation to archaeology and cultural heritage are proposed. It is noted that the proposed green infrastructure, particularly the introduction of planting along the north-eastern development boundary, will provide additional screening to soften the development edge in relation to Grade II Listed Sandridgebury House, Sandridgebury Court and the Old School (NHLE 1102836) and Grade II listed Barn and Stable Range on South Side of Stable Yard at Sandridgebury Farm (NHLE 1347255). However, as these are considered to have low sensitivity this will have no meaningful effect to the setting and significance of these assets.

9.55 In relation to standard mitigation, the archaeological interest of the site will be secured through a programme of archaeological evaluation, mitigation and post-excavation, as required. The scope and timing of such work will be discussed and agreed with the Hertfordshire Archaeological Advisor and secured as a planning condition as is common.

ASSESSMENT OF ENVIRONMENTAL EFFECTS

Magnitude of change - construction phase

9.56 The proposed development has the potential to impact buried archaeological deposits within the site, if present. The potential archaeological resource is considered to of low - moderate sensitivity / local significance in line with the criteria set out in Table 47. This is supported by the resulted of recent geophysical survey. The magnitude of change is considered Medium Adverse in line with the criteria set out in Table 48: Removal of a major part of an archaeological site and loss of research potential / significance.

9.57 The proposed development includes off site transport improvements to the south of the main site. Of relevance in terms of archaeology are proposed changes which have the potential to affect the scheduled Iron Age territorial boundary known as Beech Bottom Dyke (NHLE 1019136), where the scheduled monument crosses Valley Road and the Ancient Briton junction. At Valley Road the existing highway falls within the scheduled monument, therefore, any below ground impact including within the existing highway boundary, would require scheduled monument consent. At the Ancient Briton junction, the proposed widening of the foot/cycle paths south-west of the junction would require re-surfacing within the edge of part of the scheduled monument.

9.58 The proposed changes require very minor alterations to the existing ground surfaces for the creation of improved foot/cycle paths. On the basis that these will not require substantial groundworks and no re-modelling of the existing topography, such proposals would not result in any impact the archaeological integrity or landscape appreciation of this nationally significant Iron Age monument. This is therefore a neutral effect on a nationally significant receptor, and a neutral overall environmental effect.

Magnitude of change - operational phase

9.59 The proposed development has potential to affect the setting and significance of heritage assets within the wider area. The assessment has demonstrated that the designated assets within the wider vicinity of the site have low sensitivity, due to distance and intervening topography and vegetation. As such, the anticipated magnitude of change is considered Negligible / Neutral (permanent) in line with the criteria set out in Table 51.

9.60 As part of the proposed development, travel improvements are proposed at Ancient Briton roundabout. This includes measures such as extension of cycle/footpaths and re-configuration of existing highways that are considered to be neutral in terms of changes to the existing experience of the scheduled monuments at these locations. The introduction of additional lighting is considered neutral considering the existing sub-urban context of the monument. In relation to sound and traffic the proposals may result in slight improvements as result of encouraging less car traffic and reduced speeds. Overall, the magnitude of change in relation to the setting and experience of the scheduled monument is considered neutral.

Table 51: Summary of magnitude of change experienced by heritage assets

HERITAGE ASSET	SENSIVITY	MAGNITUDE OF CHANGE
Potential non-designated below ground prehistoric and Romano-British archaeological remains	Low - moderate	Medium adverse (permanent)
Iron Age territorial boundary known as Beech Bottom Dyke (NHLE 1019136)	High	Neutral

Significance of effect - construction phase

9.61 Appendix 9.1 concludes that the archaeological potential for the site is low to medium for previously unrecorded prehistoric to Romano-British remains. The potential for significant remains of other periods is considered low. The potential archaeological resource is considered of local significance / low sensitivity in lien with the criteria outlined in Table 47. The magnitude of change is considered medium adverse (permanent) in line with the criteria set out in Table 48: Removal of a major part of an archaeological site and loss of research potential / significance. The significance of this effect is considered to be Minor to Moderate adverse in line with the criteria set out in Table 49.

9.62 As part of the proposed development, travel improvements are proposed at Ancient Briton roundabout, c. 700m south of the site and Valley Road, c. 250m south of the site. The sensitivity of the monument is high as it is of national significance. However, given the minor changes and the existing baseline, overall, the effect in relation to construction impacts to the scheduled monument is considered neutral.

Significance of effect - operational phase

9.63 Appendix 9.1 concludes that the designated assets within the wider vicinity of the site have low sensitivity, due to distance and intervening topography and vegetation. As such, the anticipated magnitude of change is considered Negligible/ Neutral (permanent) in line with the criteria set out in Table 9.4. The significance of this effect is considered to be Negligible in line with the criteria set out in Table 9.4.

9.64 As part of the proposed development, travel improvements are proposed at Ancient Briton roundabout. The sensitivity of the monument is high as it is of national significance. However, given the minor changes and the existing baseline, overall, the effect in relation to the setting and significance of the scheduled monument is considered neutral.

Table 52: Significance of effects on heritage assets

HERITAGE ASSET	SENSIVITY	MAGNITUDE OF CHANGE	SIGNIFICANCE OF EFFECT
Potential non-designated below ground prehistoric and Romano-British archaeological remains	Low - moderate	Medium adverse (permanent)	Direct, permanent, negative minor effect
Iron Age territorial boundary known as Beech Bottom Dyke (NHLE 1019136)	High	Neutral	Neutral

ACTIONABLE MITIGATION

9.65 The implementation of a staged programme of archaeological works will allow the identification of archaeological assets within the site and a suitable mitigation strategy to be developed and agreed

with SACDC and their archaeological advisors. Mitigation responses may include preservation by record or the implementation of design responses at detailed application stage.

RESIDUAL EFFECTS

9.66 The implementation of the programme of archaeological work will result in the preservation by record of archaeological deposits impacted by the proposed development. The resulting research will contribute to the increased knowledge and understanding of the landscape and settlement evolution of the wider area. This is considered to slightly reduce the overall effects on archaeology to minor adverse.

Table 53: Residual significance of effects on heritage assets

ENVIRONMENTAL RECEPTOR/RESOURCE	SIGNIFICANCE OF RESIDUAL EFFECT
Potential non-designated below ground prehistoric and Romano-British archaeological remains	Direct, permanent, negative minor to moderate effect
Iron Age territorial boundary known as Beech Bottom Dyke (NHLE 1019136)	Neutral

CULMULATIVE EFFECTS

9.67 Construction of the proposed development could occur simultaneously with other projects located in the vicinity of the site. Sewell Park is identified as having potential for simultaneous construction or operation effects.

9.68 There are no strict guidelines for assessing cumulative effects. In terms of direct cumulative effects, due to the physical localised character of sub-surface archaeological remains, construction of 'other developments' will generally not result in cumulative direct impacts on designated or non-designated archaeological assets. The exception to this is archaeological deposits which extend beyond a development site which would be impacted by removal of contemporary deposits by development in the immediate vicinity. There are no known below ground archaeological remains within the site. There is moderate potential for previously unrecorded prehistoric to Romano-British remains, which may relate to archaeological remains in the neighbouring Sewell Park development; Conditions 24 and 25 of that planning permission requires archaeological investigations. Due to the significance of the remains being local, the environmental effect is minor and a programme of archaeological evaluation and recording will take place at both sites. No significant cumulative effects in relation to below ground archaeology are therefore anticipated.

9.69 In terms of potential indirect cumulative effects, this comprises cumulative effects to the setting of non-designated and designated heritage assets during construction and operational phases. There are no strict guidelines to cumulative assessment, however HE's five-stage settings assessment (HE 2017) provides a suitable framework.

9.70 The assessment has identified no significant effects in relation to built or designated heritage assets in the wider vicinity of the development. A screening exercise has been undertaken, using GIS analysis, desk-based survey of the assets and readily available satellite imagery to identify 'other developments' which are within / have the potential to affect the setting of the identified receptors. No receptors have been identified as being sensitive to change by the cumulative effect of the proposed development and that of Sewell Park.

CONCLUSION

9.71 This chapter presents the findings of the assessment of likely significant effects of the construction and operational phases of the proposed development in terms of archaeology and cultural heritage.

It incorporates the results of a heritage desk-based assessment (including results of a fieldwalking survey) contained in Appendix 9.1.

9.72 A review of the National Heritage List for England confirmed that there are no designated heritage assets within the main application site. The assessment has identified the potential for previously unrecorded prehistoric to Romano-British below ground archaeological remains within the site. The significance and sensitivity of the potential archaeological resource is considered low based on the results of geophysical survey. The magnitude of change is considered direct, negative medium adverse.

9.73 The implementation of a staged programme of archaeological works will allow the identification of archaeological assets within the site and a suitable mitigation strategy to be developed and agreed with SACDC and their archaeological advisors. Mitigation responses may include preservation by record or the implementation of design responses at detailed application stage. This is considered to offset rather than reduce the overall effects on archaeology which remains at minor adverse.

9.74 The proposed travel improvements at Ancient Briton junction are considered to have a neutral effect on the nationally significant Iron Age territorial boundary known as Beech Bottom Dyke (NHLE 1019136), both in terms of construction and operation.

9.75 As assessment of potential effects to designated assets in the vicinity of the development has taken place. The assessment concludes that the designated assets within the wider vicinity of the site have low sensitivity, due to distance and intervening topography and vegetation. As such, the anticipated magnitude of change is considered Negligible/ Neutral (permanent). The significance of this effect is considered to be negligible.

9.76 No cumulative effects have been identified in relation to archaeology or built heritage.

10 Ground conditions

10.1 This chapter of the ES concerns the likely significant environmental effects of the proposed development on ground conditions and the risk to future occupants of the proposed development on contamination. It has been compiled by Brookbanks Consulting Limited.

10.2 The chapter describes the existing baseline conditions, summarise the potential direct and indirect impacts of the proposed development, the likely mitigation measures required to prevent, reduce or offset the potential impacts and the residual effects. A Phase 1 Desk Study is included at Appendix 10.1.

ASSESSMENT METHODOLOGY

Study area

10.3 The study area for the purpose of this chapter is the application site, as shown within the Phase I Desk Study, and 1km area beyond the boundary.

Consultation

10.4 During the development of this chapter, the following bodies and/or document sources and interested parties have been consulted regarding the proposals: The Environment Agency ("EA"), British Geological Survey ("BGS"); and Zetica in respect of unexploded ordinance.

Legislative / planning policy context

National Planning Policy Framework

10.5 Policies and objectives which are of relevance to ground conditions and contamination include:

10.6 Paragraph 189 which states "Planning policies and decisions should ensure that:

"a site is suitable for its proposed use taking account of ground conditions and any risks arising from land instability and contamination. This includes risks arising from natural hazards or former activities such as mining, and any proposals for mitigation including land remediation (as well as potential impacts on the natural environment arising from that remediation);

after remediation, as a minimum, land should not be capable of being determined as contaminated land under Part IIA of the Environmental Protection Act 1990.

adequate site investigation information, prepared by a competent person, is available to inform those assessments."

10.7 Paragraph 190 states "*where a site is affected by contamination or land stability issues, responsibility for securing a safe development rests with the developer and/or landowner*".

DEFRA: Environmental Protection Act 1990: Part 2A – Contaminated Land Statutory Guidance

10.8 Guidance has been published by the DEFRA Environmental Protection Act 1990: Part 2A promotes the 'suitable for use' approach which focuses on the risks caused by land contamination. This approach recognises that the risks presented by any given level of contamination will vary greatly according to the use of the land and a wide range of other factors, such as the underlying geology of the proposed development. Risks therefore need to be assessed on a site-by-site basis.

Planning Practice Guidance: contaminated land

10.9 Planning Practice Guidance published in June 2014 and updated periodically, identifies that contamination is most likely to arise in former industrial locations, however it may also occur in other locations as a result of the contamination being moved from its original source. Therefore, as part of any planning application, a geo-environmental appraisal should be carried out to ascertain the level of risk posed by the proposed development and surrounding land uses past and present.

Other guidance documents

10.10 In addition to the above, the following documents provide relevant guidance on measures to control effects on ground conditions and have been taken into account in this assessment:

- CIRIA SP156 - Control of Water Pollution from Construction Sites (2002)
- CIRIA C552 Contaminated Land Risk Assessment, A Guide to Good Practice (2001)
- CIRIA C665 Assessing risks posed by hazardous ground gases to buildings (2007)
- CLR 11: Model Procedures for the Management of Contaminated Land (2020)

10.11 The guidance documents used in the production of this ES chapter also include: PPG1: General Guidance to the Prevention of Pollution; and PPG6: Working at Construction and Demolition Sites.

Assessment of process and assessment criteria

10.12 The sensitivity of a receptor (determined by evaluating a receptors susceptibility to change or value) can be analysed from the baseline information and may be summarised and classified in a table, a rudimentary example of which is provided at Table 54.

Table 54: Criteria for determining sensitivity of ground condition receptors

SENSITIVITY	RECEPTOR
High	Internationally / nationally important
Medium	Regionally important
Low	Locally important

10.13 Magnitude of change is the extent to which the proposed development will result in a change to the environmental receptor. When assessing the magnitude of change, the scale, duration, timing and extent of effects, as well as the degree of certainty in the prediction of impacts and the likelihood of irreversible changes occurring should all be considered. Table 55 defines the type of change and magnitude.

Table 55: Criteria for determining magnitude of change for ground condition receptors

EXTENT OF CHANGE	MAGNITUDE
High	Entire loss/gain or major variation to key elements/features of the baseline conditions so that the post-development character/ configuration of the baseline condition would be fundamentally changed.
Medium	Loss/gain or variation to one or more key elements/features of the baseline conditions so that the post-development character/ configuration of the baseline condition would be materially changed.
Low	Minor change from the baseline conditions. The changes are measurable, but not material in the sense that the changes are similar to those pre-development.
None	Inconsequential or no change from baseline conditions.

10.14 Table 56 provides a matrix the significance of effect derived from sensitivity of the environmental receptor/resource and the magnitude of change experienced.

Table 56: Matrix to determine significance of environmental effects on ground condition receptors

SENSITIVITY OF RECEPTOR	MAGNITUDE OF CHANGE			
	HIGH	MEDIUM	LOW	NONE
High	Major or substantial	Major/Moderate	Moderate/Minor	Negligible
Medium	Major or substantial	Moderate	Minor	Negligible
Low	Moderate	Minor	Negligible	Negligible

10.15 In the absence of 'industry standard' significance criteria for the consideration of ground conditions impacts, a qualitative approach, based upon available knowledge, experience and professional judgement, will be employed. The significance criteria that will be used for the purposes of the ES chapter are set out Table 57 below.

Table 57: Criteria for judging significance of environmental effects on ground condition receptors.

SIGNIFICANCE OF EFFECTS	DEFINITION
Major/Substantial	Land Contamination: End Users at Permanent and major environmental risks. Ground Instability: Major structural damage to buildings, with major repair works required.
Moderate	Land Contamination: Local environmental hazard to water resources, aquatic fauna and flora, and/ or humans (construction workers and/ or end users) requiring monitoring and local remedial work. Ground Instability: Non-structural damage to buildings but repair requiring services of builder. Weather-tightness of buildings impaired. Loss of functionality of floor slabs. Local damage to service pipes. Some loss of serviceability of roads/ footways requiring repair/ local replacement. Development will cause localised slope instability.
Minor	Land Contamination: Temporary and minor environmental risk to surface water resources, aquatic fauna, flora or air quality. No appreciable risk to humans (construction workers or end users). Ground Instability: Minor (non-structural) damage to building fabric (brickwork / building finishes). Some continued maintenance required to all hardstanding areas. Development will cause localised and very minor slope instability.
Negligible	Land Contamination: No appreciable environmental risk to water resources, aquatic flora and fauna and humans. Any very low negative effects are reversible. Ground Instability: No effects on ground instability.

Sources of information

10.16 Published information has been obtained in the form of:

(1) BGS Published geology
(2) EA Data
(3) Landmark Envirocheck Report
(4) Zetica UXO

Assumptions and assessment limitations

10.17 Third party information has been used in the preparation of this report, which Brookbanks, by necessity assumes is correct at the time of writing.

BASELINE CONDITIONS

10.18 The following paragraphs are based upon data included within an Envirocheck Report (Appendix 10.1).

Historic land uses

10.19 Inspection of the Ordnance Survey maps has revealed that between 1883 and the present time, the site has largely remained undeveloped, with the exception of the Sandridgebury Lane, which runs across the centre, south and east of the site. The surrounding area is shown to include a few potentially contaminative land uses. Since 1883, a railway line has been shown to bound the east of the site.

10.20 The following potentially significant contaminative land uses are on or within close proximity of the site and will be further assessed within Section 9: Agricultural, Roads (Sandridgebury Lane), Railway Line, Works and Depots and Old Clay Pits/Limekiln.

Geology

10.21 With reference to the British Geological Survey (BGS) map, the site is shown to be underlain by chalk of the Lewes Nodular Chalk Formation and Seaford Chalk Formation (Undifferentiated).

10.22 In regards to the Superficial Deposits, the majority of the north of the site is shown to be overlain by clay, silt, sand and gravel of the Clay-with-flints Formation. The majority of the southern part of the site is overlain by the Kesgrave Catchment Subgroup, comprising of sand and gravel. The Kesgrave Catchment Subgroup is also identified as outcrops in the centre and north of the site.

Radon

10.23 The site is shown to reside in areas of Intermediate Probability Radon Areas (where 1-3% of homes are estimated to be above the action level) and Lower Probability Radon Areas (where less than 1% of homes are estimated to be at or above the action level). It is reported that no radon protection measures are necessary for the construction of new developments within the site.

Estimated soil chemistry

10.24 The Envirocheck Report provides the following estimated soil chemistry* on Site, whereby the soil is described as 'rural'.

(1) Arsenic = <15 – 25 mg/kg
(2) Cadmium = <1.8 mg/kg
(3) Chromium = 60 – 90 mg/kg
(4) Lead = <100 mg/kg
(5) Nickel = 15 – 45 mg/kg

10.25 If required at the detailed design stage, confirmation of the existing site-specific soil chemistry can be established via a phase ii ground investigation.

Mining

10.26 The site is not reported to be in an area affected by coal mining. The site is reported to be in an area affected by mining instability, with the mining evidence from conclusive rock mining. there are twenty-five man-made mining cavities, situated within 1km of the site boundary. The nearest to the

site is multiple Chalkwells Cavity, for the commodity of Chalk situated 137m south-east of the site. The site is shown to be within a rare non coal mining area of Great Britain.

10.27 There are ten natural cavities located within 1km of the site boundary. One cavity (Solution pipe x 6) is stated on site within the north-east. There are fifteen BGS recorded mineral sites recorded within 1km of the site boundary, with the nearest being 209m south-east of the site for a ceased mineral site.

Hydrogeology

10.28 The underlying bedrock geology is shown to form a principal aquifers across the site.

10.29 The superficial deposits of the Clay-with-flints Formation in the north of the site, are shown to form Unproductive Strata, with the outcrops of the Kesgrave Catchment Subgroup, forming Secondary A Aquifers.

10.30 The EA's Groundwater Vulnerability Zones ("GVZ") Map includes 5 risk categories (High, Medium – High, Medium, Medium – Low and Low). The indicative risk at the site is shown to comprise of a 'Medium GVZ.

Contamination

10.31 There is one pollution incident to controlled waters recorded within 1km of the site boundary, situated 889m north of the site, which was for an unknown pollutant to the freshwater stream/river.

10.32 Nine Local Authority Pollution Prevention and Controls has been identified within 1km of the site, with the nearest being 83m east of the site for a permitted mobile screening and crushing processes.

10.33 None of the following have been recorded within 1km of the site boundary:

(1) Contaminated Land Register Entries and Notices
(2) Enforcement and Prohibition Notices
(3) Integrated Pollution Controls
(4) Local Authority Integrated Pollution Prevention and Control
(5) Local Authority Pollution Prevention and Control Enforcement
(6) Integrated Pollution Prevention and Control
(7) Prosecutions Relating to Authorised Processes
(8) Prosecutions Relating to Controlled Waters
(9) Registered Radioactive Substances
(10) Substantiated Pollution Incident Register
(11) Water Industry Act Referrals

10.34 There are one hundred and forty Contemporary Trade Directory Entries recorded within 1km of the site boundary. 29 of these are situated within 100m of the site boundary.

Hazardous Substances

10.35 There are no records of the following on or within a 1km radius of the site boundary:

(1) Control of Major Accident Hazards Sites (COMAH)
(2) Explosive Sites
(3) Notification of Installations Handling Hazardous Substances (NIHHS)
(4) Planning Hazardous Substance Consents
(5) Planning Hazardous Substance Enforcements

Waste

10.36 The site is located within the local authority landfill coverage of Hertfordshire County Council and St Albans District Council, who have both supplied landfill data.

10.37 Two licensed waste management facilities are recorded within 1km of the site boundary. The first is to Hertfordshire County Council at St Albans Household Waste Recycling Centre, Sandridge Road, located 533m east of the site. The site is categorised as a household waste amenity site, with a current license status of transferred (in September 2019). It was issued in February 1977. The second is to Veolia Environmental Service (UK) Limited, at Sandridge Gate Business Centre, Ronsons Way, located 540m east of the site. The site is categorised as a Household, Commercial and Industrial Transfer Station, with a current licence not supplied. It was issued on August 1994, with a last modification of February 2013.

10.38 One local authority recorded landfill site is recorded approximately 237m east of the site at Porters Wood. The last reported status was unknown, with no details of the type of waste or date of closure.

10.39 There are three Potentially infilled land (water) and six potentially infilled land (non-water) recorded within 1km of the site boundary.

10.40 Three registered waste transfer sites are recorded within 1km of the site boundary.

10.41 There are no provided reports of the following within 1km of the site boundary:

(1) BGS Recorded Landfill Sites
(2) Historical Landfill Site
(3) Integrated Pollution Control Registered Waste Sites
(4) Licensed Waste Management Facility (Landfill Boundary)
(5) Registered Landfill Sites
(6) Registered Waste Treatment or Disposal Sites

Unexploded ordnance (UXO)

10.42 The Zetica regional unexploded bomb risk map has outlined the proposed development is potentially located within a low bomb risk area affected by UXO activity.

Sensitivity of receptor/resource

10.43 Based on the baseline conditions noted above, it is evident that the following receptors / resources could affected by the site.

- Construction workers and contractors – becoming exposed to contaminative sources potentially produced by the site. Considered to be a high sensitivity, due to the wider impact on the receptor.
- Existing Site Users - becoming exposed to contaminative sources potentially produced by the site, during construction and post construction. Considered to be a high sensitivity, due to the wider impact on the receptor.
- Existing groundwater – potential contaminative leakages which can seep into the groundwater and aquifers. Considered to be a high sensitivity, due to the potential for alterations locally and the knock on effects to other existing conditions.
- Existing surface water - potential contamination which may end into existing surface water regimes. Considered to be a high sensitivity, due to contamination of surface water may affect other end users.
- Flora and Fauna – potential contamination being ingested by flora and fauna. Considered to be a high sensitivity, due to minimal impact on the wider network.
- Below Ground Services – Any potential contamination can alter and affect proposed/existing pipework. Considered to be a high sensitivity, due to contamination of existing pipework potentially affecting other end users.

Summary of baseline conditions

10.44 Based on the baseline conditions described above, Table 58 summarises the sensitivity of environmental receptors associated with the proposed development.

Table 58: Summary of baseline ground conditions and sensitivity to environmental receptors

ENVIRONMENTAL RECEPTOR/RESOURCE	SENSITIVITY
Human Health – Demolition and Construction Workers and Contractors	High
Human Health – Existing Site Users	High
Controlled Waters – Existing Groundwater and surface water	High
Fauna and Flora	Low
Below Ground Services – Existing Potable Water Supply Pipes, Buried Concrete and Foundations	High
Human Health – future Site Users and/ maintenance workers and contractors	High
Below Ground Services – Introduced Potable Water Supply Pipes, Buried Concrete and Foundations	High

INHERENT AND STANDARD MITIGATION

Mitigation of construction effects of development

10.45 The potential environmental effect of suspended solids discharging to watercourses and ground waters will be mitigated by adequate site controls developed by way of a Construction and Environmental Management Plan. A CEMP will be secured as a planning condition is in common practice. All contractors working on site will be required to adopt the procedures and proposed means of mitigation outlined in the document.

10.46 In order to minimise the impacts in relation to ground conditions and contamination during development, the CEMP should include the following procedures:

(1) Prohibition of any temporary construction discharges without approval of the EA;

(2) Earthworks to be completed in a manner that protects the water quality environment and ecological interest of the area. The nature of the works and the proposed implementation methods will be agreed with the EA in advance and all works will accord with the recommendations of EA pollution prevention guidance for works in, near or liable to affect watercourses;

(3) Discharges of waters resulting from construction activities will generally be directed to foul sewers, subject to approval of the drainage authority;

(4) All fuels oils and potentially contaminating substances to be stored in bunded tanks or suitable hard pave and protected areas as are appropriate;

(5) All works will be completed in accordance with the EA documents, PPG 6 Working at Construction and Demolition sites and PPG21 Pollution Incident Response Planning together with current best practice measures for the management of construction activities; and

(6) All surplus construction and demolition materials to be removed from site and reused, recycled, or disposed, in respective order of preference.

10.47 It will be incumbent on the selected contractor(s) to assess working practice related risks and impacts before implementation and control such by employing industry good practice techniques.

Furthermore, the contractor will be required to develop emergency spillage, flood, fire and contamination control procedures such that any inadvertent incidents are immediately controlled to minimise the potential impact.

10.48 Other potential effects relate to the contractor's working practices. For example, there is the potential for fuel oil spillage from stored materials supplying site plant. This potential impact will be controlled by storing such materials within bunded tanks. The works will be completed in a manner that is consistent with the need to protect the surface and ground water quality environment.

10.49 The following general mitigation measures will also be adopted as part of the site construction phase to minimise the potential impacts arising from the proposed development:

Material storage

(1) Storage compounds will be located away from any identified water features;

(2) Designated bunded "safe" areas will be provided within the compound for storage of oils and other such potentially contaminative materials.

Silt and earthworking

(3) Soil mounding to be kept to a minimum to reduce run-off;

(4) Haul roads to receive regular cleaning to prevent mud build up;

(5) Careful regulation of wash down processes to avoid washing significant quantities of silt into drains.

Accidental srpillage

(6) Emergency response requirements to be included in the construction contract requirements;

(7) Spill kits to be located in all site compounds and near any identified water feature.

10.50 All construction phase operations will be carried out in accordance with guidance contained within the EA Pollution Prevention Guidelines.

10.51 The earthworks strategy will ensure that, as far as is practicable, the total volume of earthworks required to facilitate the development balances overall, and that there is neither an excess of material to be removed nor a need for inert material to be brought onto the site to facilitate the creation of site plateaus. This strategy will continue to evolve as detailed design progresses, supported by a phase 2 ground investigation.

10.52 The building regulations require new development to consider the impact of ground movement in foundation design. Changes to future climate including temperature and rainfall may cause ground conditions to change impacting site infrastructure and structures. Therefore, the proposed development will be designed in accordance with current guidance and best practice, and this will include the consideration of changing climate on stability of the ground conditions, influencing foundation design as necessary.

Mitigation of operational stages of development

Exposure of residential end-users to contamination

10.53 Should it be necessary, a cover system could be applied across all proposed areas of soft landscaping in accordance with the Building Research Establishment document "Cover Systems for Land Regeneration, Thickness Design of Cover Systems for Contaminated Land" (2004). Such would be sufficient to protect contamination risks to human health. The minimum thickness of clean cover in landscaped areas is 600mm.

Risk to below ground structures from contaminated soil

10.54 Concrete will be designed and placed in accordance with normal good practice taking account of pH and sulphate concentrations in the ground. Plastic pipes will not be used where the ground or groundwater contains significant levels of light hydrocarbons or phenol.

10.55 Results presented in the Water Research Centre (WRc) Investigation indicate that buried concrete in the WRc could be designed for Sulphate Class DS-2 and Aggressive Chemical Environment of Concrete (ACEC) Class AC-2, in accordance with BRE Special Digest 1 (2005). However, testing of soil samples from across the rest of the site, as part of an intrusive geotechnical investigation, should be carried out to allow the correct concrete classification to be recommended.

Risk of residential and other end-users to ground gas

10.56 Gas monitoring wells should be sunk across the site prior to construction to allow levels of hazardous ground gas to be monitored in accordance with current best practice. Gas control measures should be implemented if any hazardous gas is encountered.

Risk to proposed soft landscaping

10.57 The use of a cover system, as described above, would not only protect human health but also any proposed planting in areas designated for soft landscaping, gardens, vegetation cover. Intrusive investigations would be needed to determine which areas on-site would require these cover systems.

Additional mitigation

10.58 Additional mitigation methods may be required dependent upon the assessments undertaken as part of the future geotechnical and contamination intrusive investigation across the site, which should conform to BS5930:1999 Code of Practice of site Investigation (British Standards Institute (BSi), 1999). Additional mitigation methods may also need to be employed should the development plans change in the future.

ASSESSMENT OF ENVIRONMENTAL EFFECTS

Construction

Contamination affecting human health

10.59 During construction will be disturbed by the use of heavy machinery, excavation, stockpiling and filling which may affect sensitive receptors via pathways such as inhalation, ingestion and direct contact.

10.60 The sensitivity of the receptors (residents in adjacent areas, and construction workers) is High and the magnitude of impact prior to mitigation is considered to be High, as there is potential for fundamental changes to Human health if affected. Therefore, there is likely to be a direct, local, short term, temporary substantial adverse effect if control and mitigation measures are not employed. Once embedded mitigation measures are implemented, the impact of this is considered to be negligible.

Contamination to surface water conveyance

10.61 During construction there is a risk that the surface water features in the surrounding area may become contaminated; there is also a risk that any standing water within the site may become contaminated. Sources of contamination could be from on-site activities such as fuel/oil, chemical and waste storage. After disturbing the soil, leaching of contaminants as well as spillages of hazardous contaminants will be exposed to surface run-off which could transport them into nearby surface water features.

10.62 The sensitivity of any nearby watercourses is high and the magnitude of change, is considered to be Medium as there is potential for the baseline to be materially changed. Therefore, there is likely to be a direct, local short term, temporary, minor adverse effect prior to the implementation of mitigation measures. Once embedded mitigation measures are implemented, the impact of this is considered to be minor adverse.

Contamination of groundwater

10.63 During construction there is a risk that the concentrations of contaminants in the groundwater in the principal aquifers below the site could increase. Disturbing the soil and (if required) piling the site could open pollutant pathways which could leave the aquifers at risk from contamination.

10.64 The sensitivity of the receptors is High and the magnitude of change prior to mitigation is considered to be medium as there is potential for the baseline to be materially changed. Therefore, there is likely to be a direct, local short term, temporary moderate adverse effect if control and mitigation measures are not employed. Once embedded mitigation measures are implemented, the impact of this is considered to be minor adverse.

Contamination affecting fauna and flora

10.65 During construction the soil may be disturbed by the use of heavy machinery, excavation, stockpiling and filling which may affect sensitive receptors via pathways such as inhalation, ingestion and direct contact.

10.66 The sensitivity of the receptors is Low and the magnitude of change prior to mitigation is considered to be medium as there is potential for the baseline to be materially changed. Therefore, there is likely to be a direct, local, short term, temporary and minor adverse effect if control and mitigation measures are not employed. Once embedded mitigation measures are implemented, the impact of this is considered to be negligible.

Operational

Impact on new end users/ the exposure of end-users to contamination

10.67 During the operational phase, when residential properties and other buildings are occupied or open to the public, any potential leakages of oils/contaminants, may affect sensitive receptors via pathways such as inhalation, ingestion and direct contact.

10.68 The sensitivity of the end users is high and the magnitude of change, prior to mitigation is considered to be Medium, due to the potential for the baseline condition to be materially changed. Therefore, there is likely to be a direct, local, short-term major adverse effect in the absence of any mitigation. Once embedded mitigation measures are implemented, the impact of this is considered to be negligible.

Risk to below ground structures/ services from contaminated soil

10.69 During the operational phase any potential leakages of oils/ contaminants may affect sensitive receptors via pathways such as infiltrating through the soil/ groundwater.

10.70 The sensitivity of the below ground structures is high, and the magnitude of change is considered to be Medium, due to the potential for the baseline condition to be materially changed. Therefore, there is likely to be a direct, local, permanent moderate adverse effect to below ground structures in the absence of mitigation measures. Once embedded mitigation measures are implemented, the impact of this is considered to be negligible.

Risk of end-users to ground gas

10.71 During the operational phase any ground gases which rise may affect sensitive receptors via pathways such as inhalation, ingestion and direct contact.

10.72 The sensitivity of the end users is High and the magnitude of change prior to mitigation is considered to be Low, with changes not considered to be dissimilar to pre-development. Therefore, there is likely to be a direct, local, permanent moderate adverse effect, in the absence of mitigation measures. Once embedded mitigation measures are implemented, the impact of this is considered to be Negligible.

Risk to proposed soft landscaping, flora and fauna

10.73 During the operational phase the soil may be disturbed, which may affect sensitive receptors via pathways such as inhalation, ingestion and direct contact.

10.74 The sensitivity of the end users is Low and the magnitude of change, without consideration or mitigation is considered to be Low, with changes not considered to be dissimilar to pre-development. Therefore, there is likely to be a direct, local, permanent moderate adverse effect, in the absence of mitigation measures. Once embedded mitigation measures are implemented, the impact of this is considered to be negligible.

Summary of environmental effect assessment

10.75 With the mitigation described above, no significant adverse residual effects are anticipated. Specifically, within the construction phases of development, with mitigation:

(1) The effects on human activity and health are assessed as being of short term, temporary and Negligible

(2) The effects of contamination of surface water resources are assessed as being of short term, temporary and Minor Adverse

(3) The effects of contamination of ground water resources are assessed as being of short term, temporary and Minor Adverse

(4) The effects of construction on flora and fauna are assessed as being of short term, temporary and Negligible

(5) The effects of below ground structures are assessed as being of short term, temporary and Negligible

10.76 The above analysis has been summarised in the following tables.

Table 59: Summary of magnitude of change likely to be experienced by environmental receptors

ENVIRONMENTAL RECEPTOR/RESOURCE	MAGNITUDE OF CHANGE
Human Health – Demolition and Construction Workers and Contractors	High
Human Health – Existing Site Users	High
Controlled Waters – Existing Groundwater and surface water	Medium
Fauna and Flora	Medium
Below Ground Services – Existing Potable Water Supply Pipes, Buried Concrete and Foundations	Medium
Human Health – future Site Users and/ maintenance workers and contractors	High

Below Ground Services – Introduced Potable Water Supply Pipes, Buried Concrete and Foundations	Medium

Table 60: Summary of significance of effect likely to be experienced by environmental receptors

ENVIRONMENTAL RECEPTOR/RESOURCE	SENSITIVITY	MAGNITUDE OF EFFECT	SIGNIFICANCE OF EFFECT ABSENT STANDARD MITIGATION	SIGNIFICANCE OF EFFECT WITH STANDARD MITIGATION
Human Health – Demolition and Construction Workers and Contractors	High	High	Major adverse	Negligible
Human Health – Existing Site Users	High	High	Major adverse	Negligible
Controlled Waters – Existing Groundwater and surface water	High	Medium	Moderate adverse	Minor adverse
Fauna and Flora	Low	Medium	Minor adverse	Negligible
Below Ground Services – Existing Potable Water Supply Pipes, Buried Concrete and Foundations	High	Medium	Moderate adverse	Negligible
Human Health – future Site Users and/ maintenance workers and contractors	High	High	Major adverse	Negligible
Below Ground Services – Introduced Potable Water Supply Pipes, Buried Concrete and Foundations	High	Medium	Moderate adverse	Negligible

ACTIONABLE MITIGATION

10.77 No actionable mitigation measures have been identified.

RESIDUAL EFFECTS

10.78 All of the residual effects resulting from the proposed development are presented below, identifying whether the effect is significant or not after the mitigation measures have been considered

Table 61: Significance of residual effects on ground condition related receptors

ENVIRONMENTAL RECEPTOR/RESOURCE	SIGNIFICANCE OF RESIDUAL EFFECT
Human health – demolition and construction workers and contractors	Negligible
Human health – existing site users	Negligible
Controlled waters – existing groundwater and surface water	Minor Adverse
Fauna and flora	Negligible
Below ground services – existing potable water supply pipes, buried concrete and foundations	Negligible
Human health – future Site Users and/ maintenance workers and contractors	Negligible
Below ground Services – introduced potable water supply pipes, buried concrete and Foundations	Negligible

CUMULATIVE EFFECTS

10.79 It is considered that Sewell Park will have its own control measures and it is therefore assumed that they will operate on their own correctly, with no cumulative impacts to the site. When considering the topography for this Site, it is not considered that any cumulative impacts will affect the cumulative site.

CONCLUSION

10.80 This chapter has identified that the following receptors will be affected by the proposed development: human health (i.e. existing and future Site users), controlled water (i.e. groundwater and surface water), fauna and flora, below ground services/structures.

10.81 Following mitigation, the likely effects on identified receptors are considered to be negligible save for ground water resources where a minor adverse effect could arise.

11 Water resources

11.1 This chapter of the ES assesses the likely significant environmental effects of the proposed development on the environment in respect of the local hydrology, drainage and flood risk as well as surface and ground water quality as a result of the construction and operation of the proposed development. It has been compiled by PJA Civil Engineering Ltd.

11.2 This chapter should be read in conjunction with the following appendices which have been used to inform this assessment:

(1) Woollam Park, North St Albans Flood Risk Assessment and Drainage Strategy prepared by PJA (December 2024)
(2) Topographical survey prepared by Interlock Surveys (September 2019)

11.3 The availability of potable water has been considered by Brookbanks Consulting as part of their assessment of utilities. The Utility Statement records that Affinity Water have confirmed sufficient potable water to serve future residents and occupants of the proposed development. As such this has not been assessed further.

ASSESSMENT METHODOLOGY

11.4 The water environment assessment considers effects on water quality, physical hydrology and flood risk. The nature of effects on the water environment is determined in relation to the baseline conditions of the water environment.

11.5 The assessment is based upon a qualitative and quantitative approach with reference to professional judgement and statutory guidance as appropriate. The baseline conditions are established from a desk study review, in addition to a ground investigation of the site and surrounding area. Following the establishment of the baseline conditions, an assessment of potential effects of the proposed development on the key receptors identified has been undertaken and the likely significance of these effects has been determined.

Study area

11.6 The study area is typically defined as the site boundary including a standard buffer area which is typically 500m from the site boundary. However, when defining the Study Area to potentially determine the impacts on the water environment, a hydrological watershed, Water Framework Directive ("WFD") management catchment or sewerage network cannot be delineated in this standardised manner and is dependent on a number of factors including local topography; extents of water supply and wastewater infrastructure, all of which will spatially differ and will usually extend beyond administrative boundaries. Therefore, to undertake a full and robust assessment, the extents or zone of influence of each key receptor has been considered.

Consultation

11.7 In undertaking this assessment the following organisations have been consulted: Hertfordshire County Council as the Lead Local Flood Authority ("LLFA"), the Environment Agency (EA) Affinity Water and Thames Water. Table 1.7 provides a summary of the relevant EIA scoping responses received from statutory consultees. These have been used to inform the scope of this assessment. It should be noted that not all scoping responses had been received at the time of writing this chapter.

Legislative / planning policy context

11.8 The applicable legislative framework is summarised as follows:

(1) The Environment Act (2021)

(2) The Water Resources Act 1991 (Amendment) (England and Wales) Regulations 2009

(3) Water Resources Act 1991 (Amendment) (England and Wales) Regulations 2009

(4) Land Drainage Act 1991 as amended 1994

(5) Flood and Water Management Act 2010

(6) Water Act 2003 as amended 2014

(7) The Water Environment (Water Framework Directive) (England and Wales) Regulations 2017

(8) The Water Resources (Environmental Impact Assessment) (England and Wales) (Amendment) Regulations 2017

(9) The Groundwater (England and Wales) Regulations 2009

(10) Groundwater Daughter Directive (2006/118/EC) 2006

(11) Anti-Pollution Works Regulations 1999

(12) The Environmental Damage (Prevention and Remediation) (England) Regulations 2015

(13) Conservation of Habitats and Species Regulations 2017

(14) The Environmental Permitting (England and Wales) (Amendment) Regulations 2018

11.9 The applicable planning policy is summarised as follows:

(1) National Planning Policy Framework (2023)

(2) NPPF Planning Practice Guidance (2022)

(3) City & District of St Albans Local Plan Review 1994

(4) City & District of St Albans Local Plan Review 1994 – Saved and Deleted Policies Version (July 2020)

(5) St Albans City & District Council Draft Local Plan 2041 (Regulation 18 Public Consultation, July 2023)

(6) South West Hertfordshire Level 1 Strategic Flood Risk Assessment Final Draft (October 2018)

(7) Dacorum Borough Council, St Albans City and District Council, Three Rivers District Council, Watford Borough Council, Welwyn Hatfield Borough Council Water Cycle Study (April 2010)

(8) Hertfordshire Local Flood Risk Management Strategy Level 2 (2019 – 2029)

(9) Hertfordshire LLFA Summary Guidance for Developers: Management of Surface Water Drainage (August 2021)

(10) South-West Hertfordshire Level 1 Strategic Flood Risk Assessment Level 1: Addendum for St Albans (July 2024)

(11) St Albans Level 2 Strategic Flood Risk Assessment (July 2024)

Assessment of process

11.10 A desk-based assessment has been carried out in order to establish key water receptors and the potential effects that the proposed development might have on those receptors during the construction and operational phases. The assessment comprises:

(1) Review of the site Geology (Bedrock and Superficial);

(2) Review of the study area's hydrogeology in terms of availability and water quality;

(3) Review of existing sources of data relating to the site's hydrological regime;

(4) Review of the site's flood risk and drainage related constraints;

(5) Review of the strategic water resource and supply status in addition to strategic drainage constraints within the Study area'

(6) Consideration of the historic uses, soils and contamination status of the site in order to understand the existing water quality of any watercourses within the site;

(7) Consideration of environmental design and management measures to minimise flood risk, such as the use of SuDS, water efficiency methods and consideration of best practice guidance; and

(8) Investigation of appropriate mitigation measures to avoid where possible, or minimise, any adverse effects on water quality, drainage and flood risk during the construction and operational phases of the proposed development that remain following the implementation of environmental design and management measures.

Assessment criteria

11.11 The methodology adopted within this assessment to predict the effects of the proposed development has focused on the identification and evaluation of key sensitive receptors and then focusing specifically on identifying impact 'types' and risks which have the potential to have a beneficial or adverse impact on a sensitive receptor. The level of any predicted effect has been determined using the three-stage process outlined below. The methodology and significance criteria adopted for assessing various aspects of the water environment have been developed with reference to a variety of relevant legislation drivers and guidance/best practice documents as referred to in the planning policy section of this chapter.

11.12 The assessment of potential impacts and likely significant effects should be an iterative process where the results of the assessment process should input into the design of the proposed development and the development of mitigation measures.

Value/sensitivity of the receptor

11.13 The value and sensitivity of each identified receptor/resource is qualitatively determined using the criteria set out in Table 62.

Table 62: Value/sensitivity of water related receptors

RECEPTOR VALUE/SENSITIVITY	RECEPTOR TYPE
High	• A waterbody which is of high or good ecological status and highly sensitive to change. • A waterbody of high amenity value, including areas of bathing and where water immersion sports are regularly practiced. • Sites with international and European nature conservation designations with water-dependent ecosystems: e.g., Special Protection Area, Special Area of Conservation, Ramsar Site and EC designated freshwater fisheries. Also includes all nature conservation Sites of national importance designated by statute including Sites of Special Scientific Interest (SSSI) and National Nature Reserves. • A waterbody constituting a valuable resource because of high quality and yield, extensive exploitation for public, private domestic, agricultural and/or industrial supply, or designated Sites of nature conservation are dependent on groundwater. • A floodplain or flood storage area necessary to protect essential infrastructure and/or highly vulnerable development and valued resources from flooding. • Population & Human Health.
Medium	• A waterbody of moderate ecological status and moderately sensitive to change. • A waterbody of moderate amenity value including public parks, boating, navigable watercourses, watercourses flowing through residential developments and town centres. • Non-statutory Sites of regional or local importance designated for water dependent ecosystems. • A waterbody of limited value because its quality does not allow potable or other quality-sensitive uses (but which may be used for agricultural or industrial purposes)

RECEPTOR VALUE/SENSITIVITY	RECEPTOR TYPE
	and where exploitation is not extensive, or where local areas of nature conservation are known to be sensitive to groundwater quality. • A floodplain or flood storage area protecting development and resources which are classified to be of medium vulnerability.
Low	• A waterbody of poor ecological status with little sensitivity to change. • A waterbody of low yield and quality that makes exploitation as a water resource unfeasible, or where changes to waterbody in terms of abstraction are not expected to have an impact on local ecology. • Non-statutory wetland or waterbody of local interest. • A floodplain or flood storage area with limited flood protection value.
Negligible	• A water resource of little or no interest.

Nature and magnitude of impacts

11.14 Once the sensitivity of the identified receptor has been determined, the magnitude of the impact is dependent on its size, duration, timing (e.g., seasonality) and frequency (e.g., permanent, seasonal etc.). A qualitative appraisal of the likely magnitude of the predicted impact is provided within this assessment, once the scheme's inherent mitigation measures have been considered. The nature and characteristics of impacts have been described to enable their magnitude to be determined. The nature of the impacts has first been expressed as:

Adverse – detrimental or negative impacts on an environmental resource or receptor;

Beneficial – advantageous or positive impact on an environmental resource or receptor; or

Negligible – an impact on a resource/receptor of insufficient magnitude to affect the use/integrity.

11.15 Where adverse or beneficial impacts have been identified, their magnitude has been assessed using the criteria set out in Table 63.

Table 63: Criteria for determining magnitude of change on water resources

RECEPTOR VALUE/SENSITIVITY	RECEPTOR TYPE
High	• A waterbody which is of high or good ecological status and highly sensitive to change. • A waterbody of high amenity value, including areas of bathing and where water immersion sports are regularly practiced. • Sites with international and European nature conservation designations with water-dependent ecosystems: e.g., Special Protection Area, Special Area of Conservation, Ramsar Site and EC designated freshwater fisheries. Also includes all nature conservation Sites of national importance designated by statute including Sites of Special Scientific Interest (SSSI) and National Nature Reserves. • A waterbody constituting a valuable resource because of high quality and yield, extensive exploitation for public, private domestic, agricultural and/or industrial supply, or designated Sites of nature conservation are dependent on groundwater. • A floodplain or flood storage area necessary to protect essential infrastructure and/or highly vulnerable development and valued resources from flooding. • Population & Human Health.

RECEPTOR VALUE/SENSITIVITY	RECEPTOR TYPE
Medium	• A waterbody of moderate ecological status and moderately sensitive to change. • A waterbody of moderate amenity value including public parks, boating, navigable watercourses, watercourses flowing through residential developments and town centres. • Non-statutory Sites of regional or local importance designated for water dependent ecosystems. • A waterbody of limited value because its quality does not allow potable or other quality-sensitive uses (but which may be used for agricultural or industrial purposes) and where exploitation is not extensive, or where local areas of nature conservation are known to be sensitive to groundwater quality. • A floodplain or flood storage area protecting development and resources which are classified to be of medium vulnerability.
Low	• A waterbody of poor ecological status with little sensitivity to change. • A waterbody of low yield and quality that makes exploitation as a water resource unfeasible, or where changes to waterbody in terms of abstraction are not expected to have an impact on local ecology. • Non-statutory wetland or waterbody of local interest. • A floodplain or flood storage area with limited flood protection value.
Negligible	• A water resource of little or no interest.

11.16 In the context of the proposed development, short to medium term impacts are generally considered to be those associated with the construction phase of the proposed development. Long-term impacts are those that will have a lasting effect once the proposed development is completed and operational.

Likely significance of effect

11.17 The assessment of significance is based on the nature and magnitude of the impact and the value/sensitivity of the receptors/resources. Having established the sensitivity/value of the resource/receptor in Stage 1 and the magnitude/nature of each impact in Stage 2, the matrix in Table 64 has been used with professional judgement, to determine the level of each potential effect.

Table 64: Matrix for determining significance of effects on water receptors

RECEPTOR SENSITIVITY	MAGNTUDE OF IMPACT			
	HIGH	MEDIUM	LOW	NEGLIGIBLE
High	Major or substantial	Major/moderate	Moderate/minor	Negligible
Medium	Major or substantial	Moderate	Minor	Negligible
Low	Moderate	Minor	Minor	Negligible

Significance Criteria

11.18 The level of each effect is measured through a qualitative assessment of the sensitivity of the resources and the magnitude of the impact. The extent of the potential impacts is assessed using a four point scale from 'major/substantial' to 'negligible', as presented in Table 65.

Table 65: Criteria for determining significance of effects on water receptors

LEVEL OF EFFECT	CRITERIA
Major/substantial	An effect which in isolation could have a significant influence on the decision-making process
Moderate	An effect which on its own could have an influence on decision making, particularly when combined with other effects.
Minor	An effect which on its own is likely to have a minor influence on decision making, but when combined with other effects could have more than more a greater influence.
Negligible	An effect which on its own or in-combination with other effects will note have an influence of decision making.

11.19 Effects that are deemed to be significant for the purposes of this assessment are those that are described as being moderate or major adverse/beneficial.

Sources of information

11.20 The applicable guidance and information sources are summarised as follows:

(1) Good Practice Guide for Environmental Impact Assessment (EIA), 2006 (withdrawn but still considered relevant in the absence of superseding guidance)

(2) CIRIA C753 'The SuDS Manual' (CIRIA, 2016)

(3) Sewerage Sector Guidance 2.2 (Water UK 2022)

(4) Control of Water Pollution from Construction Sites CIRIA C532 (CIRIA, 2001)

(5) Sustainable Drainage Systems – Non statutory technical standards for sustainable drainage systems (DEFRA, March 2015).

(6) R&D Publication SC030219 Rainfall Runoff Management for Developments (DEFRA/Environment Agency, 2013)

(7) GOV.UK website – http://www.gov.uk/ for flood risk and climate change information;

(8) British Geological Survey (BGS) website – http://mappapps2.bgs.ac.uk/geoindex/home.html for bedrock geology and superficial deposit classifications;

(9) Environment Agency Website – Catchment Data Explorer – https://environment.data.gov.uk/catchment-planning/ for WFD status and water quality information; and

(10) Defra's Magic Map website – https://magic.defra.gov.uk/MagicMap.aspx for aquifer designations/groundwater vulnerability/source protection zones/designated sites.

Assumptions

11.21 The conclusions and recommendations contained herein are limited by the availability of background information and the planned use for the site. Third party information has been used in the preparation of this report, which PJA Civil Engineering Ltd, by necessity assumed is correct at the time of writing.

11.22 The assessment is primarily based on publicly available data obtained from the EA, Hertfordshire County Council and commercial data supply companies, as well as additional information supplied from stakeholders during the scoping and consultation stages.

11.23 Publicly available flood risk maps do not take into account the impact of local flood defences and climate change on flooding, and do not provide information on flood depth, speed or volume of flow. The maps do not show flooding from other sources such as groundwater, direct runoff from fields or overflowing sewers. However, a description of these sources of flooding is provided in the Flood Risk

Assessment ("FRA") that is included as Appendix 11.1, such that sufficient baseline information has been available in order to undertake the assessment.

Assessment limitations

11.24 The assessment is limited by a lack of flow data for watercourses and drainage channels, and water quality data for specific ordinary watercourses in close proximity to the site.

11.25 Notwithstanding the above, overall a reasonably high level of certainty has been applied to the baseline and assessment presented in this chapter. Where available, catchment data regarding water quality has been used to inform the assessment. The information that was available is considered sufficient to establish the baseline within the study area, therefore, there are not considered to be any data limitations that would affect the conclusions of this assessment.

11.26 Similarly, the information accessible and provided by consultees in order to complete the assessment is considered to have a high level of certainty sufficient to establish the baseline with no data limitations that would affect the conclusions of this assessment.

BASELINE CONDITIONS

11.27 The following baseline conditions set out the existing situation as of 2024 relating to relevant aspects of the water environment, including sensitive water dependent receptors and water associated infrastructure within the study area.

Topography

11.28 The site is greenfield (undeveloped) in nature and comprises agricultural and sports playing fields. A review of the site topography has been undertaken based on a topographic survey produced by Interlocks Surveys Limited in August 2019 (Appendix 11.2) and publicly available 1m DTM LiDAR data.

11.29 The topographic survey demonstrates that the land generally falls in an easterly direction. The highest point within the site is located just south of the proposed highway access off Harpenden Road along the western boundary at approximately 122.5mAOD. The lowest point in the site is approximately 102.4mAOD in the east of the site.

11.30 Figure 11.1 demonstrates the existing ground levels from the Lidar survey.

Existing drainage features

11.31 The prominent watercourse within the area is the River Ver, which is a tributary of the River Colne and located approximately 4.6km to the south west of the site.

11.32 Surface water from the existing highway (Sandridgebury Lane) currently drains into small watercourse located adjacent to the highway.

11.33 The surface water from the existing private road currently drains into a small watercourse adjacent to the private road.

11.34 The remainder of the site is currently greenfield in nature. Surface water runoff flows overland in a south-easterly direction once the ground has become saturated, ponding at the lowest point.

11.35 Figure 11.2 demonstrates that this site falls to the low point as indicated by the existing site hydrological regime.

Ground conditions

11.36 From a review of the publicly available British Geological Survey ("BGS") Geology of Britain viewer, the site is identified to be underlain by a bedrock geology of Lewes Nodular Chalk Formation and Seaford Chalk Formation. Figure 11.3 demonstrates the BGS bedrock.

11.37 According to BGS records, the site is underlain by two types of superficial deposits. To the north, centre and south of the development, areas of Lewes Nodular Chalk Formation and Seaford Chalk Formation (Undifferentiated) – Chalk are situated. To the north and west of the site, a superficial geology of Clay with Flints Formation – Clay, Silt, Sand and Gravel. This is identified in Figure 11.4.

11.38 The publicly available DEFRA Magic Mapping, Bedrock Aquifer Map, identifies that the bedrock underlying the site is designated as a principal aquifer, which is described as "*aquifers which provide significant quantities of drinking water, and water for business needs. They may also support rivers, lakes and wetlands.".* These types of aquifers typically display high groundwater transmissivity and are able to yield strategic levels of water, indicating high porosity.

11.39 The publicly available DEFRA Magic Mapping, Superficial Aquifer Map, identifies that the centrally located superficial deposits underlying the site are designated as a Secondary A Aquifer, which is defined as *"aquifers comprising of permeable layers that can support local water supplies, and may form an important source of base flow to rivers*." The remaining superficial deposits underlying the site are designated as an Unproductive Aquifer, which is defined as "*Strata largely unable to provide usable water supplies and are unlikely to have surface water and wetland ecosystems dependent on them."*

11.40 These properties indicate that the majority of the upper geological layers underlying the site may not be freely draining, however, the potential for the infiltration of surface water runoff may be feasible within the deeper bedrock.

11.41 During the ground investigation, the Kesgrave Catchment Subgroup was encountered as varied cohesive and granular deposits at the majority of the tested locations across the site. The cohesive deposits comprised of slightly gravelly slightly sandy to sandy clay which corresponds with the indication that the upper underlying geological layers are not freely draining. The Seaford Chalk Formation was encountered within a few of the infiltration test locations.

11.42 From a review of the publicly available DEFRA Magic Mapping, the site lies within Zone 3 of the groundwater source protection zone. This is identified in Figure 11.5.

11.43 The bedrock of chalk and centrally located superficial deposits of chalk alongside the groundwater source protection zone mapping, indicate that infiltration is highly likely at the site given the properties of the underlying geology.

11.44 On this basis, an infiltration led surface water drainage strategy is proposed at the site. This approach mimics the existing drainage regime of the site.

Flood risk

Fluvial flood risk

11.45 There are two watercourses located within the site or in the immediate vicinity, which serve the existing highways within the site. The nearest watercourse identified from Ordnance Survey mapping is the River Ver located 4.6km to the south west of the site at its nearest point. The site is identified to lie wholly within Flood Zone 1, outside the maximum extents of identified potential fluvial flooding during the 1% AEP event and 0.1% AEP event from any nearby Main Rivers. An extract of the Flood Map for Planning is available in Figure 11.6.

Surface water flood risk

11.46 The publicly available long term flood risk information, surface water flood risk mapping, shows two corridors of surface water flood risk to flow across the site, generally in a west to east direction, which then collects and pools within the site against the railway embankment to the east of the site. Both corridors of surface water are shown to be of Low (between 0.1% and 1% probability) to High (greater than 3.3% probability) risk of flooding.

11.47 The mapping in Figure 11.7 also shows an area of low surface water flood risk located within the north east corner of the site, which flows in a south easterly direction toward the same topographically low point against the railway embankment along the eastern boundary of the site.

11.48 It should be noted that the production of this mapping has been undertaken at a national scale to provide the first publicly available generation of surface water flood risk mapping. The two previous generations were primarily developed fir regular use as the approach and risk was refine. For example, the first did not include any allowance for sewers, whilst the second incorporated a national loss coefficient.

11.49 Although this generation incorporates local estimates of the sewer infiltration loss, generally at the LLFA level along with various other refinements in runoff estimation, it does not allow for local improvements to the underlying DTM. This means that local features such as the adjoining highways are represented as determined from the LiDAR without any consideration to surface water drainage features such as culverts or small watercourses which typically provide the associated surface water drainage.

11.50 Furthermore, JBA have commented on the limitations of the publicly available Long Term Flood Risk Information, Surface Water Flood Risk Mapping within the South-West Hertfordshire Strategic Flood Risk Assessment Level 1: Addendum for St Albans. The report states "*risk of flooding from surface water ("RoFSW" should be interpreted with adequate consideration given to the limitations of this dataset."*

11.51 To enhance the understanding of surface water flood risk at the site, it is proposed that Site-specific hydraulic modelling will be undertaken to refine the baseline surface water flood risk, in addition to the post-development. The post-development hydraulic modelling process will seek to ensure that the proposed development is situated outside areas of flood risk , and surface water runoff is directed toward and through corridors of green/blue infrastructure, collecting within strategic SuDS features o landscaped areas which are proposed within the site's natural low points.

Groundwater flood risk

11.52 The Hertfordshire County Council SFRA contains mapping which includes 'Areas Susceptible to Groundwater Flooding' (AStGWF) data set, which shows the proposed development to have a <25% chance of being vulnerable to groundwater flooding. BGS records show that borehole TL10NW38, located approximately 1.3km west of the site, on Childwick Green Road, was dug to 18.8m below ground level (bgl) in 1972 and no groundwater was encountered in the depth of this borehole.

Artificial flood risk

11.53 The publicly available Long-Term Flood Risk Information, Flood Risk from Reservoirs Mapping, identifies that the site lies outside the maximum extent of flooding from reservoirs.

Other sources of flood risk

11.54 No other sources of flood risk have been identified which may affect the site. However, as part of the FRA a comprehensive review of flood risk from all likely sources has been carried out as shown in Appendix 11.1.

Water resources and water quality

Water Framework Directive (WFD) status

11.55 The site falls within the Thames River Basin which covers over 16,200km² and encompasses all of Greater London and extends from north Oxfordshire southwards to Surrey and from Gloucester in the west to the Thames Estuary and parts of Kent in the east. The Thames River has been split into 20 management catchments, of which the site falls into the Colne management catchment area.

11.56 Within the Colne management catchment, the site falls within the Upper Colne and Ellen Brook Water Body operational catchment. The watercourse is 13.877km in length, with a catchment area of 9546.294ha and forms a tributary of River Ver.

11.57 The Environment Agency employs a method for assessing the environmental conditions or 'status' of a water body according to the objectives set out within the Water Framework Directive (WFD) Regulations. To achieve the purposes of the WFD Regulations of protecting all waterbodies, the EA has set out a number of Environmental Objectives. These Environmental Objectives are reported for each waterbody which the Environment Agency operates in six-year cycles. The achievement of the Environmental Objectives is dependent upon the current ecological status, which is assessed as 'high', 'good', 'moderate', 'poor' and 'bad'.

11.58 A separate classification process applies where a watercourse is heavily modified or constitutes an artificial waterbody, as these water bodies cannot attain an ecological status of 'good' due to socio-economic reasons (such as a requirement for recreation or navigable waterways).

11.59 As noted previously, the site falls into the catchment of Upper Colne Ellen Brook Water Body. This Water Body has a hydromorphological designation of 'not designated artificial or heavily modified' with an overall waterbody status (2022) of poor. Reasons for not achieving good status include; agriculture and rural land management, urban and transport, water industry and domestic general public.

11.60 As such, the Environment Agency will be seeking improvements to the water quality and morphology of the local water system that fall within the waterbody in order to achieve a status of 'Good' by 2027.

11.61 Therefore, based on the WFD status of the Upper Colne Ellen Brook water body being poor, any watercourses within this catchment and within the site Boundary may be considered to be of low sensitivity according to Table 62. Given the ephemeral nature of the drainage network within the site, which has been artificially formed and realigned to provide a land drainage function with little ecological provision, the ditches within the site are considered to be of low sensitivity and value.

11.62 The site falls within the Mid-Chilterns Chalk Groundwater Body which has been classified as having "poor chemical and quantitative status" for 2019 (according to the Environment Agency's latest set of published results). Therefore, based on the WFD status of this groundwater body being poor, this waterbody may be considered to be of low sensitivity according to Table 62.

Environment agency abstraction licencing

11.63 The site falls within the Environment Agency's Colne Abstraction Licensing Strategy catchment. The Environment Agency's licensing strategy for this area sets out the level of water available for abstraction from natural resources (i.e., ground and surface waters) within this catchment and how these resources are managed for abstraction purposes.

11.64 This has identified that the site is in an area where the water from rivers and supporting watercourses is not available for further abstraction, even during high flows (Q30) winter conditions36. This is due to catchment flows being below the indicative requirement to help support a healthy ecology within the riverine system and achieve a WFD status of good.

11.65 Given the quantitative status of the Mid-Chilterns Chalk Groundwater Body being poor and there being no further water available for abstraction, even during high flows, this implies that the groundwater body is currently being over abstracted which is affecting both the WFD status of the groundwater body and its ability to provide a healthy baseflow to the dependent riverine system.

[36] https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/792685/Colne_Abstraction_Licensing_Strategy.pdf

Waste water network

11.66 Thames Water sewer asset mapping indicated multiple public sewers which serve the existing dwellings in the vicinity of the site.

11.67 Thames Water have been consulted and continue to be consulted as part of the site-specific Drainage Strategy to confirm the capacity of the public sewer networks in the area to receive the proposed pumped foul water discharge from the site.

Bromate and bromide plume

11.68 St Leonard's Court in Sandridge is an existing residential development, built on land previously used as a chemicals factory which manufactured brominated compounds between approximately 1955 and 1980. Historic contamination of the land surrounding the chemicals factory has caused a plume of bromate and bromide which continues to occur within the groundwater and extends approximately 20km east from the source. This plume is having a deleterious effect on the water quality of the groundwater and its use for abstraction, in addition to affecting the availability of water and the quality of the River Lee.

11.69 The latest update from January 2019 on the Government Website indicates that the pollution is currently managed through 'scavenge pumping', a process which requires the pumping of contaminated water from a closed public water supply well, treating the water and then discharging into a foul sewer. Groundwater from other public supply abstraction sources is blended to ensure that drinking water standards are met. Restrictions have been placed on abstractions from private water supplies.

Nitrate vulnerable zone

11.70 According to DEFRA's Nitrate Vulnerable Zones ("NVZ") 2021-2024 designations, as published by the Environment Agency, the site falls outside of vulnerable zones and, as such, is not considered to be currently affected or at risk of nitrate pollution from agricultural practices.

Nutrient neutrality

11.71 According to Natural England's Nutrient Neutrality Site of Special Scientific Interest ("SSSI") Mapping, the site is not affected by or fall within the catchment of a designate site that is subject to a nutrient neutrality strategy.

Designated sites

11.72 According to DEFRA's Magic Maps there are no designated sites or impact risk zones of designated sites within the site boundary.

Summary of baseline assessment

Table 66: Summary of key water environment receptors

ENVIRONMENTAL RECEPTOR/RESOURCE	SENSITIVITY	CRITERIA
Unnamed Ordinary Watercourses within the site	Low	These ordinary watercourses exhibit poor ecological status with little sensitivity to change, where most are ephemeral. These features also fall within the Colne WFD Management Catchment, which has been assessed as poor status.
Groundwater Source Protection Zone 3	Medium	The current land use at the site is agricultural and playing fields, which indicates that contamination is not likely. Therefore, the use of infiltration as a method of surface water discharge is unlikely to have an impact on the groundwater quality.

ENVIRONMENTAL RECEPTOR/RESOURCE	SENSITIVITY	CRITERIA
Mid Chilterns Chalk WFD Groundwater Body	Low	Classified as having poor chemical and quantitative status due to pollution from wastewater, urban and agricultural runoff and changes to the natural flow in water. The groundwater body in the area surrounding Sandridge, is contaminated by the existing bromide and bromate plume. The contaminated groundwater is treated or discharged into the foul water network.
Population & Human Health	High	Site users, neighbouring users and the general public.

INHERENT AND STANDARD MITIGATION

11.73 The following paragraphs provide a summary of the design measures and strategies adopted as part the proposed development to avoid or minimise the scheme's environmental impact on flood risk and water quality and its availability as a resource during its construction and operational phase. Where relevant the positive benefits the proposed development will bring are also identified.

Construction

11.74 To mitigate the short-term impacts relating to the construction phase of the development, a CEMP will be secured by a planning condition and prepared by the Principal Contractor and the Environmental Manager prior to the construction works. This will be developed in consultation with the EA, the LLFA and St Albans City and District Council (as a minimum) for approval prior to commencement of the works. The CEMP will form an overarching planning and guidance document where the contractor must demonstrate how best environmental practice will be implemented and how adverse impacts to the surrounding environment and local community will be minimised.

11.75 The CEMP will include a detailed plan for monitoring all construction activities on a regular basis to ensure compliance with the CEMP Is maintained and that any adverse impacts on key receptors is avoided or minimised as much as practicable. This will include, but not be limited to air, noise, dust, surface water, and groundwater activities; to establish the background conditions. An action plan will be established with trigger levels and this will be agreed with the relevant regulators. The action plan will define the monitoring requirements and works, and the results will be reviewed throughout the works to confirm that no unacceptable emissions from the site occur. Should an exceedance occur, the action plan will define what remedial actions must be taken.

11.76 The CEMP will take into account the phasing of the development and put in measures to ensure that any newly constructed surface water drainage infrastructure and / or watercourse is protected from a silt and/or pollution incident.

11.77 The contractor will be required to demonstrate that all site managers, supervisors, foremen and operatives together with security staff will be provided with the relevant training and awareness of Site procedures and best construction practice. Appropriate equipment such as booms and adsorption mats in the event of an accidental spillage or pollution incident will also be made available and easily accessible. Site signage should be erected showing who to contact in the event of a spillage or emergency. The EA should be informed of any pollution incidents should they occur, and action taken.

11.78 Any proposed works to the ordinary watercourses within the site will require an Ordinary Watercourse Consent or Land Drainage Consent ("LDC") under the Land Drainage Act 1991, which can be obtained from the LLFA or the Local Drainage Engineer.

11.79 The effects of construction and frequency and magnitude of an impact will be significantly reduced provided the CEMP and temporary works method statements set out in the LDC are complied with.

Operation

Surface water runoff

11.80 The proposed development will comprise areas of hardstanding and roofs (i.e., impermeable surfaces). The increase in impermeable ground across the site will reduce the ability for rainfall to infiltrate into the underlying strata, with the potential to increase the rate and volume of surface water run-off from the development. Without mitigation, this would result in greater volumes and rates of surface water run-off travelling uncontrolled, overland towards lower lying ground, potentially resulting in flooding of the site and land to the east.

11.81 Run-off from paved areas such as roads, service yards, and parking areas is more likely to contain pollutants from vehicles (e.g., oil, petrol, diesel). Without suitable mitigation, drainage of run-off from these areas has the potential to release pollutants into downstream and underlying waterbodies (i.e., the unnamed ordinary watercourses or the bedrock aquifer underlying the site).

11.82 As part of the final surface water drainage design, a variety of open SuDS will be strategically networked throughout the proposed development which will aim to ensure the discharge rate from the site will be equal to the infiltration rate calculated during the ground investigations in 2018 and 2024. This will ensure that there is no increase to the surface water flood risk from the site for all rainfall events up to the 1 in 100 year plus 40% climate change event. These SuDS will also form part of the proposed development's green infrastructure which will act to intercept and direct exceedance flows away for properties. Furthermore, the network of SuDS will provide the staged treatment required to improve the water quality of any surface water runoff from the proposed development before being infiltrated, in addition to passively cooling and hydrating the landscaped areas of the proposed development.

Foul drainage and water quality

11.83 The proposed development will install an on-site primary terminal pumping station to be strategically located centrally within the site at a suitable topographical low point, but outside any exceedance flood flow routes. Thames Water have been consulted through a developer enquiry process to ascertain whether the receiving public foul water network has capacity to receive the proposed foul water discharge rate. A response was received on the 5th April 2024, stating that the existing foul water network does not have sufficient capacity for the foul flows generated from the proposed development and as such, hydraulic modelling work of the public sewer network will need to be undertaken to assess the reinforcement works required.

ASSESSMENT OF ENVIRONMENTAL EFFECTS

Construction phase

11.84 Following the implementation of the scheme's inherent mitigation measures during the Construction Phase; it is anticipated that there should be negligible adverse effect on the key receptors identified in Table 1.62. This will be dependent on the mitigation measures outlined in the CEMP being followed and necessary environmental permitting and consents from the EA, LLFA, and St Albans City and District Council etc, being in place prior to the commencement of construction.

Operational phase

11.85 Following the implementation of the scheme's inherent mitigation measures it is anticipated that there should be negligible adverse effect on the key receptors identified in Table 66. This is however dependent on Thames Water confirming that the existing foul water sewer network has capacity to receive the proposed flows from the development.

Assessment

11.86 The table below indicates the magnitude of change due to the proposed development on the individual environmental receptors which were established in Table 67.

Table 67: Magnitude of change predicted to water receptors

ENVIRONMENTAL RECEPTOR/RESOURCE	MAGNITUDE OF CHANGE
Unnamed Ordinary Watercourses within the site	Low
Groundwater Source Protection Zone 3	Low
Mid Chilterns Chalk WFD Groundwater Body	Low
Population & Human Health	Low

11.87 Having determined the magnitude of change to the environmental receptors, the significance of the change is reviewed in the table below.

Table 68: Significance of effects on water receptors

ENVIRONMENTAL RECEPTOR/RESOURCE	SENSITIVITY	MAGNITUDE OF EFFECT	SIGNIFICANCE OF EFFECT
Unnamed Ordinary Watercourses within the site	Low	Low	Negligible
Groundwater Source Protection Zone 3	Medium	Low	Minor adverse
Mid Chilterns Chalk WFD Groundwater Body	Low	Medium/low	Moderate/minor Adverse
Population & Human Health	High	Negligible	Negligible

ACTIONABLE MITIGATION

11.88 This section sets out the actionable mitigation measures that can be applied to the design proposals to reduce or enhance the potential effects of the construction and operation of the proposed development. In terms of the construction phase of the development, no further mitigation or enhancement measures have been identified, as it is expected that the CEMP should include the necessary mitigation measure required to avoid or minimise as far as reasonably practicable any adverse impact to the key receptors identified in Table 68.

Operational phase

11.89 The current hydrological regime at the site results in untreated surface water runoff infiltrating into the existing groundwater source protection zone 3. Through the incorporation of SuDS features to provide attenuation storage a surface water treatment train will be implemented within the proposed development. The surface water treatment train has the potential to increase the quality of the surface water which infiltrates into the groundwater source protection zone 3.

11.90 Furthermore, should the proposed development demonstrate that the proposed surface water drainage system could improve the existing surface water flood risk shown to collect against Network Rail's embankment, which is classified as essential infrastructure, then the proposed development could have a medium beneficial impact on flood risk, resulting in an effect of moderately beneficial significance.

RESIDUAL EFFECTS

11.91 The below assessment demonstrates how beneficial or adverse effects may persist post mitigation and whether these effects are considered to be significant or not.

Construction phase

11.92 Generally, there should be no residual, long lasting effects following the construction period of a development. Comparatively this phase is short and transient when compared to the overall lifetime of a development. Any impact, including pollution of a watercourse or groundwater through an increase in suspended solids, fuel, cement etc and subsequent change to water quality, should be mitigated in the first instance and if any of the measures and fail safes set out in the CEMP, contractors method statements and toolbox Talks were to fail resulting in an impact of significant effect, then this could be remediated, where a pollution incident could be cleaned up, spilt cement removed, enabling a waterbody to recover, both in terms of water quality, dependent ecology and human health (where a water source is relied upon for potable supply).

11.93 However certain compounds such as Perfluorooctanic Acid ("PFAO") or Perfluoroalkyl Substances ("PFAS") which are used in construction solvents and lubricants, in addition to building materials and practices (wherever waterproofing, anti-corrosion and lubrication) can also have an adverse impact on the key receptors identified and should be considered within the construction process. PFOA/PFAS is a class of recalcitrant chemicals which are water soluble and have the potential to bioaccumulate, potentially resulting in adverse impacts on both ecology and human health over time, which on its own may not result in a significant residual effect, but cumulatively along with other anthropogenic activities in the same catchment could result in a significant residual effect. If used or applied incorrectly during the construction of the development there is a potential for these chemicals to enter the water environment and remain there as currently there is no known remediation technique for this class of chemical, due to its solubility in water and high leachability through soils.

11.94 This residual effect could be partly mitigated or prevented if the project architect, designer and engineer are able to identify PFAS in products being considered for the scheme, by requesting manufacturers to disclose product ingredients and using that information to choose certain products or select alternatives.

Operational phase

11.95 There is always a residual effect in terms of flooding and drainage where a storm and/or flood event can exceed the design standards of the development. For example, in the event of an extreme storm, where the intensity of rainfall is so great that it cannot physically enter the drainage system, surface water is generated and can potentially flood the site and flow onto neighbouring properties or public infrastructure. This residual risk cannot be mitigated for, as there comes a point where mitigating for an extreme weather event is not reasonably practicable and the cost becomes disproportionately high.

11.96 To mitigate this residual impact as far as reasonably practicable, a sequential approach to the site layout has been adopted which aims to steer new development to areas with the lowest risk of flooding from any source. This approach has been applied to the proposed development, where vulnerable development has been steered away from the existing surface water flow paths bisecting the site west to east, ensuring the development remains safe for its lifetime.

11.97 Furthermore, the proposed development will be profiled and designed to channel excess surface water via the highway infrastructure and green/blue network, away from buildings and toward landscaped or undeveloped areas. The mitigation measures that will be adopted as part of the proposed development to manage the impact of an exceedance event is described in further detail as part of the Flood Risk Assessment and Drainage Strategy in Appendix 11.1.

Table 69: Significance of residual effects on water receptors

ENVIRONMENTAL RECEPTOR/RESOURCE	SIGNIFICANCE OF RESIDUAL EFFECT
Unnamed ordinary watercourses within the site	Negligible
Groundwater Source Protection Zone 3	Long term minor adverse
Mid Chilterns Chalk WFD Groundwater Body	Long term minor adverse
Population and human health	Long term minor adverse

11.98 The spatial extents of long term minor adverse significant residual effects, of recalcitrant chemicals such as PFOA on receiving key receptors, cannot be definitively determined as the quantum of chemical to enter the local water environment cannot be predicted, nor the extents by which these chemicals will disperse.

CUMULATIVE EFFECTS

11.99 This section considers the cumulative effects of new major development situated within the vicinity of the site, which to date includes the adjacent development at Land to rear of 112-156B Harpenden Road by Cala Homes.

11.100 It should be noted that the consideration of cumulative effects is of a qualitative nature. Levels of effects or significance have not been attributed as part of this assessment.

Surface water flood risk

11.101 As set out in Section 2.42, the long term flood risk information, surface water flood risk mapping, shows two corridors of surface water flood risk to flow across the site, generally in a west to east direction, which then collects and pools within the site against the railway embankment to the east.

11.102 A review of the proposed development adjacent to the site, shows a surface water flow route to originate within the landownership boundary of the adjacent Cala Homes site, flowing overland and bisecting the site in an eastly direction. Hydraulic modelling was undertaken as part of the Flood Risk Assessment (Flood Risk and Drainage Statement, Ref. P23-405-Issue 2, July 2024) for the development proposed by Cala Homes, to understand if the development of the site would increase flood risk to third-party land.

11.103 The post-development hydraulic modelling produced for the adjacent development, demonstrates that the majority of surface water runoff will be contained within the Cala Homes boundary. However the existing flow route will be retained and continue to bisect the site from west to east.

11.104 The post-development hydraulic modelling demonstrates that the proposed development adjacent to the site will maintain the baseline surface water flow route and as such will not impact on the existing surface water flood risk, maintaining the status quo. As such the development proposed by Cala Homes should not result in a cumulative effect in relation to surface water flood risk.

Surface water drainage

11.105 As part of the final surface water drainage design, a variety of open SuDS will be strategically networked throughout the proposed development which will aim to ensure the discharge rate from the site will be equal to the infiltration rate calculated during the ground investigations in 2018 and 2024. This will ensure that there is no increase to the surface water flood risk from the site for all rainfall events up to the 1 in 100 year plus 40% climate change event. These SuDS will also form part of the proposed development's green infrastructure which will act to intercept and direct exceedance flows away for properties. Furthermore, the network of SuDS will provide the staged treatment required to improve the water quality of any surface water runoff from the proposed development before being

infiltrated, in addition to passively cooling and hydrating the landscaped areas of the proposed development.

11.106 After a review of surface water drainage strategy for the adjacent development (Land to rear of 112-156B Harpenden Road), it is proposed that surface water will be pumped to the west of the Cala Homes Site, discharging into the existing public Thames Water surface water sewer.

11.107 Given Thames Water has a statutory duty, as a risk management authority, to ensure that flood risk from sewers is not increased, under the Floods and Water Management Act, it can be assumed that the discharge of surface water from the proposed Cala Homes development will not have a cumulative impact on flood risk from surface water sewers. Furthermore the proposed development will adopt a different mechanism to dispose of surface water drainage i.e. via infiltration and not to public surface water sewer, affecting two different receptors. On this basis there is no cumulative effect.

Foul water drainage

11.108 As set out in Section 1.5, consultation has been undertaken with Thames Water to discuss the available capacity within the existing public sewerage network along Harpenden Road. Thames Water stated that due to the proposed development on-Site, the existing public foul water sewerage network will not have capacity to accommodate the full development at this time.

11.109 A review of the Flood Risk Assessment (Flood Risk and Drainage Statement, Ref. P23-405-Issue 2, July 2024) sets out that the proposed development adjacent to the site, will pump flows into the existing public foul water sewer network situated along Harpenden Road. At the time this information was produced as part of Flood Risk and Drainage Statement, Ref. P23-405-Issue 2, July 2024, Thames Water had stated that capacity was available within the system to accommodate foul water flows from the adjacent development site (Land to rear of 112-156B Harpenden Road).

11.110 Water companies are required to produce a Drainage and Wastewater Management Plan (“DWMP”), which sets out their 25-year long term plan (2025 – 2050) demonstrating how they intend to extend, improve and maintain a robust and resilient wastewater system against future pressures such as climate change, population growth and urbanisation.

11.111 Thames Water will be statutorily required to provide the necessary foul sewerage capacity required to support growth throughout the St Albans area. Provided that offsite reinforcement works can be delivered in a timely manner to receive foul flows from each committed development before it becomes occupied and operational, then there should be no cumulative effect as a result, i.e. increased flooding of the public sewer network and deterioration of WFD waterbodies as a result of increased Combined Sewer Overflow (“CSO”) spills and insufficient treatment capacity at waste water treatment works.

11.112 If this was to become an issue however Thames Water could control the occupation rate of each proposed development by imposing a Grampian condition on any relevant planning application, thereby still averting the potential to have a cumulative effect on the key receptors, providing this is reasonable and enforceable (as set out in paragraph 57 of the NPPF).

11.113 Due to this strategic planning and regulatory mechanism in place, it is considered that there should be no cumulative effect as a result of the committed schemes coming forward. In the event that Thames Water are not able to deliver their programme of works to cater for the additional foul flows in the time required, then as a last resort a Grampian condition can be applied to any relevant planning application, preventing development from becoming occupied until the necessary reinforcement works are complete.

CONCLUSION

11.114 This assessment of the site in relation to flood risk, drainage, groundwater and surface water quality issues has been undertaken as a desktop study in line with best practice guidance.

11.115 Baseline conditions have been established using readily available information, including web-based information and a desk-based assessment.

11.116 This information has been used to identify key receptors and the associated sensitivity/value of each of these receptors, which include: (1) Unnamed Ordinary Watercourses within the site (Low); (2) Groundwater Source Protection Zone 3 (Medium); (3) Population & Human Health (High)

11.117 Potential impacts with respect to construction and operational phases of the proposed development on these key receptors and their effects have been identified as part of this assessment and following the inherent mitigation, as set out within this chapter, it is identified that in both the construction and operation phase, it is anticipated that there should be negligible to minor adverse effects on key receptors identified.

11.118 The assessment has demonstrated that providing the mitigation measures identified in this assessment and supporting FRA and Drainage Strategy are adhered to, the proposed development will sustainably manage the drainage of the site and flood risk (both on- and off-Site) for its lifetime, accounting for the effects of climate change. There are residual flood risks associated with any extreme storm event and water supply. However, these have been mitigated for as far as reasonably practicable.

11.119 Therefore, the proposed development has the potential to have a minor adverse level of effect on the groundwater protection zone 3 and the Mid Chilterns Chalk WFD Waterbody, as a result of the use of PFOA during the construction of the development and the reduction of aquifer recharge due to the introduction of impermeable surfaces and reduction of surface water infiltration. As an individual development these minor adverse effects are considered to be not significant. A summary of the assessment is set out in the table below.

12 Socio-economics

12.1 This chapter has been prepared by LRM Planning, the purpose of which is to provide an assessment of the likely significant effects of the proposed development on human beings, more commonly referred to as the study of socio-economic effects. Specifically, it considers the effects in terms of population, housing, education provision, healthcare provision, open space requirements, community facilities, and economic effects.

12.2 As a mixed-use development, the scheme will provide a mix of housing, to include affordable and specialist accommodation, community infrastructure, open space, sports facilities, and education provision. It is anticipated that the scheme will be constructed over a period of 10 years, albeit new dwellings and premises will be occupied on a phased basis throughout this period.

12.3 The proposed development will increase the housing stock in the local area of St Albans and will assist with accommodating the future forecast population and household growth. Future residents will present their own community facility infrastructure needs, and, as such, there are potential impacts on existing education, healthcare, open space, and community provision. The proposed development can also be expected to have economic effects during both the construction and operational phases of development.

12.4 The scheme responds to the emerging Local Plan, which identifies the site as a Broad Local to meet the District's future development needs. The Regulation 19 version of the Local Plan indicates the future capacity of the site as a Broad Location for growth, which includes circa 1146 new dwellings in addition to a two-form entry primary school, green infrastructure, transport infrastructure, and other infrastructure. Other infrastructure can also expect to be provided via planning obligations. This chapter has taken into account these measures in the assessment of the socio-economics.

12.5 Other chapters have also considered the effects of the proposed development on human beings as environmental receptors, for example, where they experience changes in noise levels, air quality, travel and movement, or views of the site. Those assessments are not repeated here in the interests.

ASSESSMENT METHODOLOGY

Study area

12.6 The assessment of effects is based on the following four geographies:

(1) Local – effects within the immediate environs of the site;

(2) Town – effects on the city of St Albans;

(3) District– effects on the St Albans district; and

(4) Regional – effects within Hertfordshire.

12.7 It is noted that Hertfordshire is made up of 10 local authority areas, comprising Broxbourne, Dacorum, East Hertfordshire, Hertsmere, North Hertfordshire, St Albans, Stevenage, Three Rivers, Watford, and Welwyn Hatfield.

Consultation

12.8 This assessment has, where relevant, taken into consideration the consultation responses received to the Environmental Statement Scoping Report. Specifically in relation to socio-economics, responses to the Scoping Report identified several specific assessments which should be considered as part of this process, namely, an assessment of the impact of the proposed development on the St Albans Household Waste Recycling Centre, and a Health Impact Assessment. An assessment on the recycling centre is made within Chapter 13, and a Health Impact Assessment is provided separately in Appendix 12.1.

Legislative and planning policy context

12.9 The St Albans City and District Local Plan was adopted in July 1994 and had an end date of 2001. It is time expired and no longer up to date. The Local Plan does not identify land to meet current and future development needs.

12.10 Policy 2 identifies the Plan's settlement strategy and identifies St Albans City as a main urban area.

12.11 Policy 7A identifies a requirement for affordable housing to be delivered on sites which either measure more than 0.4 hectare, or propose 15 or more dwellings. Criterion (a) states that the Council will seek a proportion of affordable housing based on site and marketing conditions and local housing need.

12.12 Policy 93 requires that public open space is provided in accords with Policy 70 criterion (xi). This lists standards for different types of play space.

12.13 Policy 143B concerns Implementation and requires new development to provide for infrastructure either (i) in the form of on-site facilities directly related to the proposed use in the interests of comprehensive planning; and (ii) off-site facilities necessary as a result of the development in order to avoid planning an additional burden on the existing community.

12.14 Also forming part of the development plan for St Albans, the Sandridge Neighbourhood Plan is of relevance. It was "made" in July 2021 and is considered to be up to date. Its policies only apply that part of the application site which is within Sandridge Parish – i.e., the area of land to provide the new playing fields and the new footpath/cycleway to Hertfordshire Way.

12.15 There are no policies within the Sandridge Neighbourhood Plan which are of relevance to this chapter, or the consideration of community infrastructure and socio-economic effects of the proposed development.

12.16 The Regulation 19 version of the new Local Plan identifies the application site as one its Broad Locations for future development.

Assessment process and criteria

12.17 The process and criteria used in this assessment are consistent with the methodology set out in Chapter 4, although professional judgement rather than quantitative measures of change is employed in this instance.

12.18 The various environmental receptors are each treated as high sensitivity on the basis that there are no standard qualitative and quantitative criteria that can be applied to determine sensitivity of socio-economic receptors. Moreover, new development is required to provide or contribute towards the provision of infrastructure necessary to make the development acceptable.

12.19 The baseline conditions are described, and the change predicated to be caused by the proposed development is explained. The significance of that effect is determined on the basis of the matrix explained in Chapter 4 and by reference to the definition in Table 12.1.

Table 70: Definition of significance of environmental effects on socio-economic considerations.

SIGNIFICANCE	DEFINITION
Substantial (Major)	These effects are generally, but not exclusively associated with sectors or populations of national or regional significance. A chance at a regional or district scale may also enter this depending on the nature of the impact.
Moderate	These effects, if adverse, whilst important at a local scale, are not likely to be key decision-making issues. In combination with other similar effects, these effects could influence decision making.
Minor	Any effects are local issues which are unlikely to have an influence on decision making, but when combined with other effects, could have a more material influence.

SIGNIFICANCE	DEFINITION
Negligible	An effect which on its own, or in combination, with other effects will not have will not have an influence on decision making.

Sources of information

12.20 Information used in this chapter has been compiled from the following sources:

(a) Office for National Statistics ("ONS");
(b) National Health Services England;
(c) South West Hertfordshire Local Housing Needs Assessment Update (March 2024);
(d) UK Government; and
(e) St Albans City and District Council Draft Open Space Study (June 2023).

Assumptions and limitations

12.21 It has been assumed that all online platforms for data collections were correct at the time they were consulted. These platforms were used to form part of the baseline conditions for this chapter.

12.22 It is assumed that the development is to be constructed generally in accordance with the phasing and implementation as described in Chapter 3.

12.23 The cumulative assessment is based on the professional judgement of this EIA team, having regard to the development proposals and accompanying documentation.

BASELINE CONDITIONS

12.24 This section provides the baseline data relative to socio-economic characteristics. For context, the majority of the application site lies in the Bernards Heath ward, and a small portion, where the new pitches are to be located, is located within the Sandridge and Wheathampstead ward. St Albans District itself is made up of 20 wards. Unless indicated otherwise, any data has been sourced from the ONS 2021 Census, and St Albans City and District Council.

Population

12.25 The ONS 2021 census information indicates that the population of St Albans is approximately 148,200. (The mid year estimates for 2022 forecast a population of 148,358 by the middle of that year).

12.26 Bernards Heath accounts for approximately 8,152 persons, whilst Sandridge and Wheathampstead make up around 7,971 persons. St Albans has experienced a population growth of circa 7,500 (5.4%) since the 2011 census, which estimated a population of 140,700. This pattern has been experienced across both the Bernards Heath and Sandridge and Wheathampstead wards, with annual population changes of 0.88% and 0.03% over this period, respectively.

12.27 The South West Hertfordshire Local Housing Needs Assessment published in March 2024, is an update to the work published in September 2020. It suggests that the population will continue to increase in St Albans over the period to 2041, projecting a change in population of 24,487 over the 20 year period from 2021, increasing to an estimated 173,128. This equates to an expected annual population growth of circa 1,224 persons.

12.28 The table below demonstrates the predicated population change for this period by age cohorts, demonstrating that the elderly cohort will experience the greatest level of population growth, with an estimated increase of 41.7%.

Table 71: Population change 2021 to 2041

AGE	POPULATION 2021	POPULATION 2041	CHANGE IN POPULATION	% CHANGE FROM 2021
Under 16	31,952	33,284	1,332	4.2%
16 – 64	90,992	103,421	12,429	13.7%
65 +	25,697	36,423	10,726	41.7%
Total	148,641	173,128	24,487	16.5%

Source: South West Hertfordshire Local Housing Needs Assessment Update

12.29 This pattern of change is consistent with the projected population change for the wider South West Hertfordshire region, which estimates a total population increase of between 18.9% and 23.3% for the same period, with an increase of between 47% and 49.4% for the 65+ age group. The younger populations will continue to increase but at a more significant rate than St Albans, at between 7.5% and 12% for the under 16 age group, and between 15.1% and 19.9% for the 16 – 64 group.

Age profile

12.30 The age profile of the resident population is shown in Table 72.

Table 72: Age profile 2021

AGE	ENGLAND (%)	ST ALBANS (%)
0 – 9	11.3	12.8
10 – 19	11.8	13
20 – 34	19.6	14.9
35 – 49	19.4	22.4
50 – 64	19.4	19.7
65 – 74	9.8	8.8
75 – 84	6.1	5.8
85 +	2.4	2.7

Source: Office for National Statistics

Household growth

12.31 In 2021, there were 58,990 households in the St Albans district[37]. This is greater than the dwellings that were recorded in St Albans district in 2021[38]. The increase of 2,850 dwellings across a 10-year period indicates an annual household growth of 285 dwellings.

Housing stock and tenure

12.32 Table 74 demonstrates that household ownership in St Albans is higher than the county average, at 70.9% rather than 64.6%. The same can be said for the Sandridge and Wheathampstead ward (72.6%), whilst Bernards Heath falls slightly below the county average (62.5%). It follows that the level of rented housing is lower in St Albans (28.5%) than the county (34.3%).

[37] 2011 Census date, via "Basic facts about St Albans broken down by Ward". Local Government Association. Available at: https://www.stalbans.gov.uk/sites/default/files/attachments/Basic%20facts%20about%20St%20Albans%20broken%20down%20by%20Ward.pdf

[38] 2021 Census data, via "St Albans". Area Insights. Available at: https://areainsights.co.uk/borough/st-albans/

Table 73: Households by tenure

TENURE	ENGLAND	HERTS	ST ALBANS	BERNARDS HEATH	SANDRIDGE AND WHEATHAMPSTEAD
Owns outright	32.5	31.3	34.9	26.8	39.4
Owns with mortgage or loan or shared ownership	29.8	34.1	36.5	36.3	33.4
Social rented	17	17.7	12.2	11.2	17.2
Private rented or living rent free	20.6	16.7	16.4	25.5	10

Source: Office for National Statistics

House types

12.33 The data demonstrates that St Albans has a higher than average percentage of detached (26.3%) and semi-detached (30.2%) houses when compared to the county average (21.0% and 28.5% respectively). The percentage of terraced houses and purpose built flats is also lower than the county average.

Table 74: House types

HOUSE TYPE	ENGLAND	HERTS	ST ALBANS	BERNARDS HEATH	SANDRIDGE AND WHEATHAMPSTEAD
Detached	22.9	21.0	26.3	19.7	32.2
Semi-detached	31.5	28.5	30.2	22.1	33.9
Terraced	23	26.3	20	20.9	16.2
Purpose built flat	22.2	20.5	18.8	29.5	14.6
Other	0.4	3.7	4.7	7.8	3

Source: Office for National Statistics

Housing projections

12.34 The Local Housing Needs Assessment Update published in 2024 for South West Hertfordshire reveals a baseline household projection increase of 6,318 dwellings between the period 2023 and 2033, with the number of households increasing from 64,294 to 70,612 This equates to a projected annual provision of 632 new dwellings. The assessment continues to assess household projections based on the "standard method", which adjusts the baseline figure to account for an affordability ratio of 17.61 The overall local housing need for St Albans is therefore calculated as 885 dwellings per annum (capped).

12.35 The government are in the process of reviewing the NPPF, and it is acknowledged that the proposed reforms to the standard methodology could impact calculations for housing need. For St Albans, the proposed changes are expected to increase the housing need to circa 1,544 new dwellings per annum, an increase of approximately 650 new dwellings per year. This exceeds a five-fold increase of the historic annual household growth of 285 dwellings between 2011 and 2021 noted above.

House prices

12.36 The average house price in St Albans has been consistently higher than the county average since 2017. As of April 2024, the average house price in St Albans is £135,798 higher than in Hertfordshire. This is higher than the previous year, where the average cost of a house in St Albans was £111,743 higher than in Hertfordshire.

12.37 The average house price for Hertfordshire and St Albans is significantly higher than the national average, which was £298,229 in April 2024.

12.38 St Albans has experienced an increase in house prices between April 2023 and April 2024, whilst Hertfordshire and England have both witnessed a decline in the average cost of a house.

Table 75: Average house prices

YEAR (APRIL)	ST ALBANS	HERTFORDSHIRE
2024	£668,895	£442,078
2023	£559,138	£447,395
2022	£597,527	£449,261
2021	£536,718	£417,110
2020	£545,417	£398,697
2019	£495,413	3394,218
2018	£517,197	£401,599
2017	£519,319	£393,883

Source: Office for National Statistics

Affordable housing

12.39 The Local Housing Needs Assessment for South West Hertfordshire Update identifies a need for affordable housing to address an existing need and historic backlog.

12.40 For the period 2020 to 2036, it identifies an overall affordable housing need of 3,324 for South West Hertfordshire, of which, 802 affordable dwellings are required for St Albans per annum.

12.41 The District Council publish annual monitoring reports which provide the number of new affordable homes built in successive years. This historic delivery in shown in Table 76.

Table 76: Affordable housing completions

MONITORING PERIOD		TOTAL COMPLETIONS	AFFORDABLE HOUSING COMPLETIONS
Long term: 1994/95 – 2021/22	Total	11,046	2033
	Average per year	395	73
Short term: 2017/18 - 2021/22	Total	2276	459
	Average per year	455	92

Source: St Albans City and District Council Annual Monitoring Report

Education

12.42 State education provision for residents of St Albans comprises a number of primary schools, which feed into a range of secondary schools, including comprehensive, Church of England, catholic, and single sex schools. These schools and their capacity are highlighted below in Tables 77 and 78. A separate note prepared by EFM is included at Appendix 12.2

Primary education

12.43 There are 16 local education authority funded primary schools within a c.3km radius of the site, a number of which are accessible within a 3km walking distance. It is these schools available within walking distance, shown in Table 77, which are considered to offer appropriate capacity for this development.

Table 77: Primary school provision

NAME	DISTANCE FROM SITE	PUPILS ON SCHOOL ROLL	CAPACITY	AVAILABLE SPACES
Margaret Wix Primary School	1.4km	136	210	74
Bernards Heath Infant, Nursery and Junior School	1.8km	610	630	20
Garden Fields Junior Mixed and Infants School	1.9km	523	630	107
Wheatfields Primary School	2.4km	623	630	7
Maple Primary School	2.4km	217	240	13
Aboyne Lodge School	2.7km	183	210	27
Alban City School	2.6km	383	420	37
Skyswood Primary and Nursery School	3.2km	212	210	-2

Source: Educational Facilities Management Partnership Limited

12.44 The data suggests that other than Skyswood School, there is capacity within a number of local primary schools which are within walking distance of the site. Notwithstanding this, the District Council have allocated land at North St Albans for a new two-form entry primary school with the intention that it will accommodate anticipated population growth in St Albans.

Secondary education

12.45 There are a number of local education authority funded secondary schools within a 5km radius of the site, seven of which are within a 5km walking distance and are considered suitable to serve this development. These are noted below in Table 78.

12.46 The closest secondary schools are St Albans Girls' School, and Townsend Church of England Secondary School. Both schools currently draw pupils from a geographic area which extends beyond St Albans, including Chiswell Green, How Wood, Bricket Wood, Radlett, Hemel Hempstead and Kings Langley. It is expected that pupils living on the site in the future will have priority in the admissions criteria over those applying from further away, and on this basis, it is considered that there is potentially more future capacity than is immediately obvious.

Table 78: Secondary School Provision

NAME	DISTANCE FROM CENTRE OF SITE	PUPILS ON SCHOOL ROLL	CAPACITY	AVAIALBLE SPACES
St Albans Girls' School	320m	1436	1450	14
Townsend Church of England Secondary School	1.6km	776	958	182
Sandringham School	2.6km	1760	1700	-60
Loreto College	3km	942	970	28
Verulam School	3.2km	1066	1018	48
Beaumont School	4km	1594	1580	-14
Marlborough School	4.7km	1306	1308	2

Source: Educational Facilities Management Partnership Limited

Open space and recreation

12.47 An Open Space Study published by SACDC in April 2024 reveals the current provision of open space for St Albans, and the wider district.

12.48 With the exception of parks and gardens, St Albans provides a lower quantum of open space when compared to the wider district provision. The availability of allotments and space for children and young people falls only slightly short of the current provision within the district, however, the under provision of natural and semi-natural green space, and amenity greenspace, is more significant.

Table 79: Provision of open space

OPEN SPACE TYPOLOGY	CURRENT PROVISION AT ST ALBANS (HA PER 1,000 POPULATION)	CURRENT PROVISION AT ST ALBANS DISTRICT (HA PER 1,000 POPULATION)
Parks and gardens	0.88	0.71
Natural and semi-natural greenspace	0.95	3.46
Amenity greenspace	1.10	1.53
Provision for children and young people	0.04	0.06
Allotments	0.24	0.28
Total	**3.21**	**6.04**

Source: Open Space Study

12.49 The application site includes three existing playing pitches which measure approximately three hectares. These form part of the Woollam Playing Fields and are leased to the Old Albanian Sport Association.

12.50 The pitches form part of a much larger playing pitch provision in St Albans, which according to the Playing Pitch Strategy Update published by SACDC in January 2019, includes 354 pitches. These comprise:

(1) 21 artificial grass pitches;

(2) 102 junior and mini football and rugby pitches;

(3) 198 football pitches;

(4) 35 cricket pitches; and

(5) 56 rugby pitches.

12.51 It is noted that of the 354 pitches, the majority (257) are within public ownership, with the remainder (97) being private.

12.52 For the period up to 2036, there is a need for a number of playing pitches to be delivered throughout the district, as demonstrated below in Table 80.

Table 80: Future requirement for playing fields up to 2036

REQUIREMENT	ST ALBANS DISTRICT	ST ALBANS
Public playing pitches	36	12

Source: Draft Open Space Study

12.53 The emerging Local Plan prescribes open space requirements for new development as follows:

(1) 15.3sqm of amenity green space per person;

(2) 34.6sqm of natural and semi-natural green space per person;

(3) 7.1sqm of parks and gardens per person;

(4) 57sqm in total of multi-functional green spaces, comprising the three typologies at bullet points one to three, per person;

(5) 4.5sqm of allotments per person; and

(6) 0.6sqm of children's play areas per person.

Retail provision

12.54 The application site is circa 1.5km walking distance from the services available at New Greens, which includes local retail provision and facilities. It is also approximately 3km from the principal retail area of St Albans which hosts a wide range of commercial, shopping, leisure and employment opportunities. The main shopping areas are focused around Chequer Street, which offer high street stores, pharmacies, banks, convenience stores, hairdressers/barbers, restaurants, coffee shops, a museum, a library, hotels, and a cathedral.

Healthcare

12.55 There are 15 existing NHS general practice surgeries in St Albans, of which, 14 are accepting new patients according to the NHS "Find a GP" service. There are also three surgeries in Harpenden which are accepting new patients. St Albans benefits from a city hospital, which is situated some 2.8km to the south-west of the site. The anticipated population increase of St Albans will give rise to an increased demand for healthcare facilities locally.

Employment and economy

12.56 The application site is conveniently situated to the north of St Albans, with the city centre being some 3kms to the south. The retail, commercial and leisure provision noted above provides employment opportunities throughout the city.

12.57 There are also a number of major employment generators within proximity to the site, including but not limited to the industrial uses at Porters Wood Industrial Estate to the immediate south east of the site and Ronsons Way, St Albans City Hospital, and the civic offices.

MITIGATION MEASURES

12.58 The current Local Plan for St Albans contains a number of saved policies, none of which pertain to specific infrastructure or community obligations. The Regulation 19 version of the draft Local Plan to 2041 supports the provision of new and improved facilities as part of the spatial strategy at Policy SP1, whilst Policy SP7 relates specifically to community infrastructure. It sets out the Council's position for new development and how it can contribute to community infrastructure, stating at criterion c that there is a requirement for provision to be made for enhancing and providing additional capacity for such infrastructure, if required, as a result of the impacts of new development.

12.59 Policy LG1 also notes the requirement for the application site to deliver community infrastructure, in the form of a two-form entry primary school, transport infrastructure, and community infrastructure, as part of the Broad Location allocation. Certain other infrastructure will be secured by means of planning obligation.

Inherent mitigation measures

12.60 The proposed development is for a mixed use scheme, which proposes the following inherent mitigation measures:

(1) Up to 1000 new homes (C3) of which 40% shall be affordable housing and 3% self and custom build housing and shall include four adult disability service units and up to 80 apartments for age restricted specialist accommodation for the elderly;

(2) An 80-bed care home;

(3) A local centre providing retail, employment and community facilities;

(4)A two-form entry primary school;

(5) New areas of accessible greenspace including a linear park providing areas of amenity open space, children's playspace; the relocation of an area of playing fields to Longcroft and the construction of a two changing room pavilion.

Standard mitigation measures

12.61 The planning permission will have associated with it a legal agreement with obligations relating to infrastructure, which includes direct provision or financial contribution towards certain aspects of community infrastructure.

ASSESSMENT OF ENVIRONMENTAL IMPACTS

Construction phase

12.62 A development of this scale will have a significant associated construction period, which is expected to span a period of approximately 10 years.

12.63 During this period there will be some borough minor beneficial impacts in terms of construction work and associated local economy benefits. A scheme if this scale is estimated to directly support 3,200 person-years of employment within the construction sector over the entire construction phase, which equates to 320 per-years per annum. Directly supported construction sector employment is estimated to generate wages of £110 million over the entire construction phase, which equates to £11 million per annum.

12.64 Potential adverse effects as a result of construction impacts, namely in respect of noise, air quality, and construction traffic, may also be experienced by nearby residents and those who occupy the development during the construction period. These adverse effects are associated with construction activities and will be managed and minimised through a Construction Environment Management Plan. Details of these construction effects are addressed within the technical chapters of this ES.

12.65 The new houses will be constructed in a phased manner, and infrastructure provision is intended to respond to this phasing, with the population of the development gradually increasing over time. This avoids the risk of existing services and facilities suddenly becoming overwhelmed.

12.66 Notwithstanding this, the increase in population will naturally give rise to community needs that will be satisfied through a combination of utilising existing community infrastructure within the locality, and the provision of new facilities within the proposed development.

12.67 It will not be possible to precisely match the increase in population that occurs as the development is constructed and dwellings are occupied, with the provision of the associated infrastructure. Trigger events will be determined through the Section 106 Agreement to ensure effects are minimised, but it is expected that the timeframes for delivering the local centre and school will be influenced by the occupation of a certain number of dwellings.

12.68 Accordingly, it is likely that there will be a short term, local, minor adverse effect when new residents occupy the development, but the new facilities are not yet fully operational. Notwithstanding this, on completion, the proposed development will provide significant new community infrastructure, the benefits of which are explored further below.

Occupation phase

Population and housing

12.69 It is expected that upon completion, the proposed development will provide homes for approximately 2,400 residents, plus occupants of the care home. This is based on an average of 2.4 persons per dwelling.

12.70 Excluding the retirement living and extra care accommodation, the proposed development will result in the provision of 920 dwellings, of which, 40% will be affordable. The proposed development would provide open market housing, affordable housing, specialist accommodation for the elderly, adult disability service units, and self and custom build housing opportunities. Extra care accommodation

is proposed to form part of the affordable housing element to meet the need for elderly persons, or alternative age restricted retirement housing.

12.71 The increase in housing stock, which includes a substantial amount of affordable housing, and family housing is a substantial beneficial, borough, long-term and direct effect of the proposed development.

12.72 The indicative housing mix demonstrates the range and choice of housing which is to be provided in response to population and household growth projections and planning policy.

12.73 It illustrates a broad range of housing which is to be provided, which will accommodate a range of people, including single people, families, and the elderly. There is no saved policy in the current Local Plan relating to housing mix. Policy HOU1 of the emerging Local Plan sets the Council's aspirations for housing mix for new residential development, and the indicative housing mix above looks to respond to these expectations. Within the context of the overall beneficial effect of increased housing supply, this range of housing proposed of a substantial beneficial, borough, long term and direct effect.

Education

12.74 St Albans City and District Council and Hertfordshire County Council as the Local Education Authority have identified the need for a two-form entry primary school at North St Albans. This is to include early years provision, which will be delivered as part of the school. Nursery provision is also to be provided, albeit this will be delivered as part of the wider community facilities.

12.75 The primary school, including the early years provision, is proposed to be located within the northern portion of the site, between residential parcels A and C. It will measure 2ha in size. Such provision is shown on the Land Use Parameter Plan contained at Appendix 3.1. Its provision will be secured via the Section 106 Legal Agreement.

12.76 The nursery will be separate to the school and will be delivered as part of the local centre, which is located centrally to the scheme. The delivery of the nursery will also be secured via the Legal Agreement.

12.77 In combination with the existing school capacity noted above, it is considered that the proposed development will have a negligible impact on primary education and early years provision.

12.78 The development would also generate extra demand for secondary education. The County Council have indicated that financial contributions are expected to contribute to this.

12.79 On the basis of the above, the proposed development will have a negligible effect on local secondary education provision.

Open space and recreation

12.80 The Green Infrastructure Parameter Plan shown at Appendix 3.1 illustrates the locations of open green spaces and their proposed typologies. The various components include amenity green space, natural and semi-natural green space, parks and gardens, children's play areas, and teenage areas.

12.81 A large portion of green and open space is proposed to run centrally through the site, following Sandridgebury Lane, towards a large open space along the eastern boundary. The extensive tracts of green land will be accessible to both future and existing residents of North St Albans, including those at Sewell Park who will benefit from direct pedestrian connections to and from the site. This element of the proposed development is considered a moderate beneficial, long term, local and direct effect.

12.82 The proposed development also accommodates the relocation of the three existing sports pitches, which accommodate rugby and cricket uses. These will be sited to the north of the site, to the east of Woollam Playing Fields. Future users will also benefit from a new pavilion, which will include new changing room facilities. Lighting assessments have been conducted and undertaken to assess the light spill of floodlighting at these pitches and St Albans Girls School, and understand the effect of this on the proposed development. This report is contained at Appendix 12.3. In neither instance would light spill adversely affect residential amenity of future occupants of the development, provided that suitable mitigation is provided adjacent to the Woollam Playing Fields access road in the form of a hedgerow as shown on the landscape drawings.

12.83 Financial contributions are also proposed to be made for football provision at Toulmin Drive / William Bird Open Spaces. Although on-site provision is ordinarily the preference, Sport England have agreed that the provision of one football pitch as generated by the proposed development, would more logically be situated where there are existing facilities.

12.84 This represents a qualitative improvement to the existing rugby and cricket facilities, and a quantitative improvement to the football facilities. In combination, there will be a minor beneficial, long-term, local and direct effect.

12.85 The emerging Local Plan prescribes open space requirements for new development. How this relates to the proposed development at North St Albans, on the basis of an estimated population of 2,400 noted above, is demonstrated in Table 81.

Table 81: Proposed open space provision

USE	REQUIREMENT PER PERSON	REQUIREMENT FOR 2,400 PERSONS	PROPOSED PROVISION
Amenity green space	15.3sqm	3.67ha	6.03ha
Natural and semi-natural green space	34.6sqm	8.3ha	8.8ha
Parks and gardens	7.1sqm	1.7ha	2.88ha
Allotments	4.5sqm	1.08ha	0.67ha
Children's play areas	0.6sqm	0.14ha	0.18ha

Community services

12.86 The proposed development includes a local centre, which will principally host a range of facilities in use class E and F. The centre is of a scale that is commensurate with the size of the scheme and follows a pattern of development that is experienced elsewhere in St Albans. The additional retail and commercial provision in the locality will complement the existing services. The impact is assessed as minor beneficial, long-term and local in scale.

12.87 The population increase is expected to have a beneficial effect on the vitality of existing local community services and retail offers, not least given the increased and enhanced pedestrian connectivity. The impact is assessed as minor beneficial, long-term and local in scale.

Healthcare

12.88 The increase in population will give rise to increased demand for healthcare facilities locally, and the proposed development therefore proposes the addition of a new healthcare surgery within the local centre. It is therefore anticipated that the proposed development will have a negligible effect on healthcare services.

Employment and economy

12.89 The proposed development will increase the local population by approximately 2,580 persons. This means there will be employment, retail expenditure and economic activities increased through the growth of population at St Albans. An Economics Benefits Statement has been prepared to assess the potential economic and employment impacts, and wider economic issues, associated with the proposed development. This is contained at Appendix 12.4.

Summary

12.90 A summary of the impacts for the occupational phase of development is provided below.

RESIDUAL EFFECTS

12.91 As no actional mitigation measures are proposed, the residual effects are as set out above in Table 82.

North St Albans

12.92 The proposed development described for North St Albans will result in the provision of additional market, affordable, extra care, and retirement housing. It also proposes education provision in the form of a two-form entry primary school, healthcare services, a local centre which will offer retail, community and businesses uses, a new sports pitch pavilion, and communal open spaces.

12.93 Planning permission has been obtained separately for a portion of land to the immediate west of Hallam's site, for up to 150 residential dwellings. This accommodation will offer a mix of affordable and market housing. In addition, it will provide public open spaces and pedestrian connections.

12.94 The 150 dwellings form part of the North St Albans allocation identified in the Regulation 18 version of the Local Plan. They will have similar effects as the proposed development. The community infrastructure and open spaces that are part of the proposed development on site will support future residents of Sewell Park.

12.95 In overall terms, the development of the wider area will have substantial beneficial, long term, direct socio-economic effects.

12.96 The provision of various open spaces will result in a moderate beneficial effect.

12.97 The provision of community spaces throughout the scheme, principally within the local centre, will result in minor beneficial effects.

12.98 The population growth anticipated as a result of the proposed development will result in additional demand for education and healthcare. The provision of a two-form entry primary school, a healthcare surgery within the local centre, and financial contributions will result in negligible effects

Table 82: Summary of socio-economic effects.

RECEPTOR	DESCRIPTION OF IMPACT	INHERENT AND STANDARD MITIGATION MEASURES	TYPE OF EFFECT	SIGNIFICANCE OF EFFECT
Population (housing)	Increase in housing to meet future population and household growth	Delivery of up to 930 open market and affordable houses, in addition to 80 extra care units and 70 retirement living units.	Local Long term Direct	Substantial beneficial
Population (primary education provision)	Additional pupils of primary school age that need to be accommodated	Provision of a two-form entry primary school, including early years provision. A separate nursery will be provided.	Local Long term Direct	Negligible
Population (secondary education provision)	Additional pupils of secondary school age that need to be accommodated	Financial contributions to be made.	Long term Direct	Negligible
Population (access to open space)	Future residentials require open space and recreation opportunities	Provision of a range of open space typologies within the development, to be accessible for new and existing residents.	Local Long term Direct	Moderate beneficial
Population (access to community facilities)	Future residents will require community facilities conveniently located	Delivery of a local centre within the development, to include retail, community, and business uses	Local Long term Direct	Minor beneficial
Population (access to health care services)	Future residential will increase the demand for healthcare facilities	Provision of a healthcare surgery within the local centre, and financial contributions to be made.	Local Long term Direct	Negligible

13 Waste and material assets

13.1 This chapter of the ES concerns the likely significant environmental effects of the proposed development on Waste. It has been compiled by Brookbanks Consulting Limited. It provides information regarding the existing/baseline conditions, summarise the potential direct and indirect impacts of the proposed development, the likely mitigation measures required to prevent, reduce or offset the potential impacts and the residual impacts.

ASSESSMENT METHODOLOGY

Study area

13.2 The study area is considered to be the proposed development red line boundary, with a review of the impact on the wider City of St Albans.

Legislative / planning policy context

Waste Management Plan for England

13.3 The DEFRA Waste Management Plan for January 2021 presents the government's vision for managing waste and resources in a sustainable manner. It provides a strategic overview of waste policy and sets targets at a national level for the reduction of household, industrial and commercial waste streams, including at least 70% by weight of construction and demolition waste is subjected to material recovery.

13.4 The production of waste is a natural result of economic and social activity by businesses and consumers, and has been throughout human history. There are costs and benefits involved – the resources used in the production process and the benefits gained from consuming goods and services. The key is to ensure that the value we extract from resources is not exceeded by the costs of using them, and therefore that we do not produce excessive amounts of waste. It is also important to make sure that waste is optimally managed, so that the costs to society of dealing with waste, including the environmental costs, are minimised.

Waste strategy

13.5 The UK's Waste Strategy sets out plans to tackle the growth in waste, in part by increasing the value of returns from recycling, composting and energy recovery. It has also set targets for better waste management.

13.6 The Government has set challenging statutory recycling performance targets for all local authorities to contribute to achieving better waste management. Local authorities are making significant strides towards meeting the statutory standards. The standards form part of the Best Value Framework which requires local authorities to set challenging targets to improve their waste management services.

13.7 In 2002 the Government's Strategy Unit also published "Waste Not, Want Not", a strategy for tackling waste in England. The volume of waste is growing and in particular, household waste is rising by 3% per year. The overall aim of the policy was to ensure that by 2020 England had a waste management system that allows the nation to prosper whilst reducing harm to the environment and preserving resources for future generations.

13.8 To achieve the Government's principal goals for reducing waste in the UK, the Landfill Directive (1999/31/EC) was formally brought into force in the UK on 15th June 2002 as the Landfill (England & Wales) Regulations, 2002. This has now been implemented in the UK (from 16th July 2004) and

reclassifies landfill sites into inert, hazardous and non-hazardous. The Landfill Directive's principal focus is as follows:

(1) The historic practice of co-disposal of hazardous wastes with municipal wastes will cease and all hazardous waste will go to designated hazardous waste landfill.

(2) Co-disposal of non-hazardous wastes with municipal solid waste (MSW) will still be permitted.

(3) Prohibition of several waste types, e.g. liquid waste, will impact on disposal options available.

(4) The biodegradable content of new landfills will need to be drastically reduced in accordance with the Directive and the National Waste Strategy targets. This will require major changes in the minimisation, segregation, and treatment / collection of the biodegradable content of current domestic and commercial wastes.

13.9 Other measures by the Government to promote waste minimisation include the landfill tax escalator, packaging regulations, waste awareness campaigns, and producer responsibility, through EU Directives and through voluntary initiatives.

National Planning Policy Framework

13.10 National planning policy is now set out in a single overarching framework, the NPPF, updated in December 2023. The NPPF does not contain specific waste policies however, it outline that provisions for waste management should be made which correlates to the scale and quality of the development.

13.11 The environmental objective for achieving sustainable development includes:

> *"to protect and enhance our natural, built and historic environment; including making effective use of land, improving biodiversity, using natural resources prudently, minimising waste and pollution, and mitigating and adapting to climate change, including moving to a low carbon economy."*

13.12 And to facilitate the sustainable use of minerals;

> *"so far as practicable, take account of the contribution that substitute or secondary and recycled materials and minerals waste would make to the supply of materials, before considering extraction of primary materials, whilst aiming to source minerals supplies indigenously."*

National Planning Policy for waste

13.13 The National Planning Policy for Waste ("NPPW") published in October 2014 should be considered alongside DEFRAs Waste Management Plan for England updated in January 2021 (which supersedes the Waste Management Strategy for England).

13.14 In line within PPS10, the Government's goal to work towards a more sustainable and efficient method in which we use and manage our resources is set out within The Waste Management Plan for England, in which it aims to drive waste management and planning up the waste hierarchy, outlined as:

- The most effective environmental solution is often to reduce the generation of waste, including the re-use of products – prevention
- Products that have become waste can be checked, cleaned or repaired so that they can be re-used – preparing for re-use
- Waste materials can be reprocessed into products, materials, or substances – recycling
- Waste can serve a useful purpose by replacing other materials that would otherwise have been used – other recovery
- The least desirable solution where none of the above options is appropriate – disposal.

13.15 During construction, the obligation of management, maintenance and monitoring of the plan pass to the principal contractor.

Local policy

13.16 The District Local Plan Review 1994 remains the currently adopted Local Plan. The new Local Plan is due to be adopted in March 2026.

13.17 Section 13 of the Local Plan reviews minerals and waste and Policy 29 states "*the District Council will encourage initiatives to re-use and recycle waste and use bio-degradable materials.*"

13.18 Hertfordshire Council adopted the Waste Development Framework: Waste Core Strategy & Development Management Policies Development Plan Document 2011-2026 in November 2012. Chapter 4 of this document, Strategy for Waste Management, outlines 20 policies to address waste management across the county.

Assessment of process

13.19 The format of this section of the ES follows a standard approach, by setting out an appraisal of the baseline conditions, followed by a description of the proposed development features and an identification of potential environmental effects due to the proposed development. The importance of each mechanism and an assessment of each potential effect are then considered along with any mitigation measures and recommendations for further investigations where necessary.

13.20 Methods of assessment have been employed that are consistent with current guidance and recommendations in the form of statutory documents and recognised publications to ensure that the findings represent a robust approach to the Assessment.

Assessment criteria

13.21 For the purposes of this assessment the study area has been taken as the site boundary. The potential effects of the proposed development on waste include:

(1) Construction phase:

- waste generated from site clearance and earthworks
- waste generated from construction activity

(2) Operational phase:

- waste generated by businesses and people using the facilities once operational

13.22 The sensitivity of a receptor (determined by evaluating a receptors susceptibility to change or value) can be analysed from the baseline information and may be summarised and classified in a table.

Table 83: Sensitivity of waste related receptors

SENSITIVITY	RECEPTOR
High	Receptor has a very limited or no capacity to accommodate physical or chemical changes. Receptor possesses key characteristics which contribute significantly to the distinctiveness, rarity and character of the resource.
Medium	Receptor has a limited capacity to accommodate physical or chemical changes or influences.
Low	Receptor has a moderate capacity to accommodate physical or chemical changes or influences.

SENSITIVITY	RECEPTOR
Negligible	Receptor is generally tolerant of and can accommodate physical or chemical changes or influences.

13.23 Magnitude of change is the extent to which the proposed development will result in a change to the environmental receptor. When assessing the magnitude of change, the scale, duration, timing and extent of effects, as well as the degree of certainty in the prediction of impacts and the likelihood of irreversible changes occurring should all be considered. Table 84 defines the type of change and magnitude.

Table 84: Magnitude of change to waste related receptors

EXTENT OF CHANGE	MAGNITUDE
High	Entire loss/gain or major variation to key elements/features of the baseline conditions so that the post-development character/ configuration of the baseline condition would be fundamentally changed.
Medium	Loss/gain or variation to one or more key elements/features of the baseline conditions so that the post-development character/ configuration of the baseline condition would be materially changed.
Low	Minor change from the baseline conditions. The changes are measurable, but not material in the sense that the changes are similar to those pre-development.
Negligible	Inconsequential or no change from baseline conditions.

13.24 Table 85 provides a matrix the significance of effect derived from sensitivity of the environmental receptor/resource and the magnitude of change experienced.

Table 85: Metric of significance for waste related effects

SENSITIVITY OF RECEPTOR	MAGNITUDE OF CHANGE			
	HIGH	MEDIUM	LOW	NONE
High	Major or substantial	Major/Moderate	Moderate/Minor	Negligible
Medium	Major or substantial	Moderate	Minor	Negligible
Low	Moderate	Minor	Negligible	Negligible
Negligible	Minor	Negligible	Negligible	Negligible

13.25 In the absence of 'industry standard' significance criteria for the consideration of waste impacts, a qualitative approach, based upon available knowledge, experience and professional judgement, will be employed. The significance criteria that will be used for the purposes of the ES chapter are set out Table 86 below.

Table 86: Definition of significance for waste related receptors

SIGNIFICANCE OF EFFECTS	DEFINITION
Major	An effect which in isolation could have a material influence on the decision-making process.

SIGNIFICANCE OF EFFECTS	DEFINITION
Moderate	An effect which on its own could have moderate influence on decision making, particularly when combined with other similar effects.
Minor	An effect which on its own is likely to have a minor influence on decision making, but when combined with other effects could have a more material influence.
Negligible	An effect which on its own or in combination with other effects will not have an influence on decision making.

Sources of information

13.26 Published information has been obtained in the form of:

(1) Environment Agency Data

(2) St Albans City and District Council

(3) Hertfordshire County Council

Assumptions and assessment limitations

13.27 Third party information has been used in the preparation of this report, which Brookbanks, by necessity assumes is correct at the time of writing. While all reasonable checks have been made on data sources and the accuracy of data, Brookbanks accepts no liability for same.

BASELINE CONDITIONS

13.28 Given that activity associated with the site is limited mainly to agricultural practices, minimal waste arising, and resource consumption occurs. Waste arising would mainly consist of organic materials which is assumed would either be composted or used as a soil improver on site, with other waste materials being sent off site for treatment and/or disposal. Baseline is thus based on zero waste generation from the site (which represents a worst case).

Waste condition

13.29 There are no public bins currently in the boundary of the proposed development or landfill sites or fly tipping areas.

13.30 The site is located within the Local Authority Landfill Coverage of Hertfordshire County Council and St Albans District Council, who have both supplied landfill data.

13.31 Two Licensed Waste Management Facilities are recorded within 1km of the site boundary. The first is to Hertfordshire County Council at St Albans H W R C, Sandridge Road, located 533m east of the site. The site is categorised as a Household Waste Amenity Site, with a current license status of Transferred (in September 2019). It was issued in February 1977. The second is to Veolia E S (UK) Limited, at Sandridge Gate Business Centre, Ronsons Way, located 540m east of the site. The site is categorised as a Household, Commercial and Industrial Transfer Station, with a current licence not supplied. It was issued on August 1994, with a last modification of February 2013.

13.32 One local authority recorded landfill site is recorded approximately 237m east of the site at Porters Wood. The last reported status was unknown, with no details of the type of waste or date of closure.

13.33 There are three potentially infilled land (water) and six potentially infilled land (non-water) recorded within 1,000m of the site boundary.

13.34 There are three registered waste transfer sites are recorded within 1km of the site boundary.

13.35 There are no provided reports of the following within 1km of the site boundary:

(1) BGS Recorded Landfill Sites
(2) Historical Landfill Site
(3) Integrated Pollution Control Registered Waste Sites
(4) Licensed Waste Management Facility (Landfill Boundary)
(5) Registered Landfill Sites
(6) Registered Waste Treatment or Disposal Sites

Waste collection

13.36 Hertfordshire County Council is a Waste Disposal Authority and has the responsibility of disposing of household waste. However, business' have a duty to arrange appropriate waste and recycling collections. It then becomes the responsibility of the waste carrier to dispose of it safely.

13.37 Trade waste and recycling collections are available from a range of waste management companies that operate in the district. District Councils are obliged to provide a chargeable collection service if requested. Private contractors also provide a range of waste management services including:

- Waste disposal
- Recycling
- Waste collection
- Skip hire
- Waste transfer

13.38 St Albans Recycling Centre is open Thursday to Monday 10am to 6pm and can take a range of waste products.

13.39 Current bin collection for the residential properties in the area is on a Thursday working on a fortnightly rota, alternating between general waste and dry recycling and gardening waste. While food waste is collected every week.

13.40 HCC published their Local Authority Collected Waste Spatial Strategy in April 2022. This document assesses the current capacity of the recycling centres in the county and has found that the St Albans centre is close to capacity on a daily basis.

13.41 The document also identifies that: *a significant proportion of the planned housing growth (over 50%) to 2037 being within 3 miles of the east to west corridor, specific pressures will be evident at the RCs along this route,* which includes the St Albans recycling centre.

13.42 Due to the increasing demand on these centres, with a 10.86% expected growth in St Albans catchment, Hertfordshire are looking to developing the recycling centre network, by assessing new locations. Due to its current location St Albans recycling centre has no further development planned, therefore relocation to a larger site is preferable.

Existing Waste Generation & Indicators

13.43 Table 5 of the above shows the current (2022-2023) waste levels generated for both Hertfordshire County and St Albans City and District areas, including the distribution between household and non-household waste and recycling to non-recycling volumes. Table 6 then considers the National Indicators for Waste that measure performance of local authorities: NI 191 – Residential Waste per household, NI 192 – Percentage of household waste sent for reuse, recycling or composting, and NI 193 – Percentage of Municipal Solid Waste sent to landfill

Local authority waste generation 2022-2023 (tonnes)

LOCAL AUTHORITY	TOTAL WASTE COLLECTED	TOTAL HOUSEHOLD WASTE	TOTAL NON-HOUSEHOLD WASTE	LA COLLECTED WASTE RECYLCING COMPOSTING AND REUSE	LA COLLECTED WASTE NOT RECYCLYING	LA COLLECTED ESTIMATED REJECTS
Hertfordshire	504,234	471,499	32,735	253,545	250,688	4,955
St Albans	50,024	49,759	266	29,942	20,082	140

LOCAL AUTHORITY	RESIDUAL HOUSEHOLD WASTE PER HOUSEHOLD (KG/HOUSEHOLD)	PERCENTAGE OF HOUSEHOLD WASTE SENT FOR REUSE, RECYCLING OR COMPOSITNG	PERCENTAGE OF MUNICIPAL WASTE SENT TO LANDFILL	COLLECTED HOUSEHOLD WASTE PER PERSON (KG)
Hertfordshire	449.7	51.2%	10.7%	398.8
St Albans	316.2	60.1%	-	335.3

13.44 The residual household waste for the local authorities are significantly below that for the South East in general, which is 492kg/household and the England average of 509kg/household.

13.45 The recycling rates are above that for the South East in general, which are 45.4% and the England average of 41.7%.

13.46 In regard to the percentage of municipal waste sent to landfill, Hertfordshire is well above the Soth East in General, which is 3.1% and still above the England average of 7.3%

13.47 The above information has been sourced from government statistics for local authority waste and also show for Hertfordshire and Sta Albans that there are year on year improvements, reducing the volume per house hold waste, increasing the percentage of waste reused, recycled, composted and decreasing percentage of waste sent to landfill.

13.48 The HCC Waste Needs Assessment also confirmed that the total waste arisings in 2020 were 2.178Mtpa and expected this to rise to 2.260Mtpa by 2040.

Future Baseline

13.49 If the proposed was not to proceed, it would be expected that waste generation levels and management methods would be unlikely to change significantly compared to the existing conditions. However, any population increase in the region would contribute to an increase in waste arisings which would require subsequent management. The per household levels of waste are reducing year on year and would be expected to continue, which provides some mitigation, along with the HCC Waste Needs Assessment (2022), which has considered the potential waste increases, confirmed management methods and identified solutions and requirements for the future to ensure adequate waste management.

Sensitive receptors

13.50 Based on consideration of the site, the proposed development and the local waste situation the following have been identified as sensitive receptors.

(1) Waste treatment and recycling facilities - Risk of under capacity due to additional pressure on existing facilities

(2) Human Health (i.e. existing and future Site users) - becoming exposed to pollutive sources produced on Site, during construction and post construction

(3) Ground and Water Contamination - potential contaminative leakages which can seep into the groundwater and aquifers

(4) Visual Impact of the surrounding areas – abandoned waste throughout the Site or on the surrounding roads and laybys

13.51 The following table gives a sensitivity to various waste related typologies.

Table 87: Sensitivity of waste related typologies and receptors

ENVIRONMENTAL RECEPTOR/RESOURCE	SENSITIVITY
Human Health – Existing Site Users	High
Human Health – Demolition /Construction Workers, Contractors, Future Residents	High
Waste Collection, treatment and recycling facilities, non-hazardous and hazardous landfill sites	High
Ground Contamination	High
Water Contamination	High
Visual Impact of the surrounding areas.	Medium

INHERENT AND STANDARD MITIGATION

Mitigation of construction effects of development

Site clearance, earthworks and construction activity

13.52 In general terms, the waste strategy for the proposed development will be designed to:

(1) Minimise the production of waste during construction.

(2) Segregate, recycle, reuse and dispose appropriately of all construction wastes

(3) Provide facilities within the proposed development to encourage the recycling and appropriate disposal of waste.

13.53 In mitigation of the potential effects, it is advised that the subsequent contractors should subscribe to industry good practice guidelines and processes in the form of the Considerate Contractors Scheme or the like. Good practice design and site-based measures that are routinely implemented, include:

i) **Avoidance**: Good site quality control
Careful storage of materials to avoid weather damage.

ii) **Reduction**: Careful design to minimise waste production.
Reduction of packaging from suppliers

iii) **Reuse**: Take back / return of certain material packaging and protections such as pallets.
On-site reuse of topsoil, sub-soil and hardcore.

iv) **Recycling**: Returning off-cuts of materials such as plasterboard.

v) **Disposal**: Provision of segregated skips to aid off-site recycling.

13.54 A CEMP will outline the correct procedure to discarding waste. Following the correct procedures there will not be a long-term impact on the sensitive receptors.

13.55 In accordance with the site Waste Management Plan Regulations, a Waste Management Plan will be prepared and agreed with the local authority ahead of development commencing. The WMP is a practical working document held by contractors). The WMP will consolidate the site management and mitigation measures developed in more detail as part of the detailed design and planning stages.

13.56 The WMP is likely to include measures in relation to the following matters:

(1) An earthworks strategy the primary emphasis of which will be to limit the disposal of excavated material off-site to landfill, to limit the need to import fill material to the site and to reuse wherever possible any appropriate material generated during construction whether as fill material or for the strategic landscaped areas. Opportunities exist to seek a balanced cut and fill on the site where possible, to reduce the import and export of materials.

(2) Responsibility to address on-site compliance, monitoring of health and safety and maintaining good on-site working practices including good storage and waste management practices.

(3) Working practices to reduce waste at source, reuse and recycling waste where practical. Such measures should consider the opportunities for the segregation of recyclable materials, the storage of waste and of materials to avoid material wastage, the dissemination of awareness of good practice measures to reduce waste at source.

(4) Reducing material wastage through the effective handling, storage and delivery of materials to prevent loss or damage through exposure to the weather, mud and on-site vehicles.

(5) Security measures to prevent any loss of materials from vandalism or theft of material.

(6) Disposal measures including arrangements for the management of traffic setting out appropriate access points away from sensitive receptors and permissible haul routes and delivery times.

(6) A suitable programme of monitoring to determine the success of waste management practices employed on the site and to review measures for the reduction and management of waste and promoting recycling.

Achieving Reductions in Construction Waste

13.57 Suppliers of raw materials to the site are committed to reducing any surplus packaging associated with the supply of any raw materials. This includes the reduction of plastics (i.e. shrink wrap and bubble wrap), cardboard and wooden pallets. This may involve improved procurement and consultation with selected suppliers regarding commitments to waste minimisation, recycling and the emphasis on continual improvement in environmental performance.

13.58 Where practicable, waste streams that have the potential to be reused on-site or transported off-site for recycling will need to be segregated. Although every effort will be made to retain all suitable materials onsite, it is possible that some of these materials cannot be reused or recycled during the construction process. In these situations, the Site Managers will work to identify a nearby Transfer Station or suitably licensed facility in order for material to be redistributed as fill on other suitable sites. This represents the most sustainable alternative to landfill disposal.

Sustainable Selection of Construction Materials

13.59 A sustainable materials selection strategy will be prepared prior to the construction. Measures will be taken, such as face-to-face 'toolbox talks' and provision of clear operational instructions, to ensure that contractors are committed to the operation of good practice measures on-site with emphasis on

continual improvement and identifying appropriate opportunities to reduce waste, promote recycling and use recyclable materials. The ordering of appropriate, minimum amounts of building materials will be part of the materials selection strategy.

13.60 Following mitigation implemented through the WMP the construction effects are assessed to have a minor short-term impact and a negligible long-term impact.

Earthworks (reclamation) phase

13.61 Any Asbestos containing materials will be identified on-site prior to implementation with Stage II and III asbestos surveys. Specialist contractors will be used to carefully remove all asbestos materials from the site to a licensed landfill.

13.62 Site earthwork will involve the removal of topsoil, cutting and filling of sub-soils and the placement of material to provide a formation for construction operations, as necessary.

13.63 Vegetation will be cut out and then shredded and chipped before being taken off site for composting or reuse as mulch.

13.64 Topsoil will be stripped and stored discretely within site stockpiles for reuse in the completed development. It is anticipated that 100% of the topsoil will be reused.

13.65 Sub-soils will be cut and filled in a controlled manner to avoid contamination or water logging to ensure that the material is suitable for reuse. It is anticipated that 100% of the uncontaminated sub-soil material may be reused within the development area.

13.66 If any contaminated materials are identified during the Phase II site investigations, these will be treated on site where possible make to the material suitable for re-use, or to reduce the volume that is removed from the site. However, all material across the site with the potential to result in harm to flora or fauna will be removed to a suitably licensed reception site.

13.67 It is anticipated that the majority of material arising from the reclamation activities will be recycled and / or reused on site.

13.68 A WMP will be updated and monitored throughout the construction process to assist in achieving the waste targets.

13.69 Waste management proposals are to be implemented during the site reclamation phase that will reduce waste across the waste hierarchy and result in a significant reuse of materials within the site.

Mitigation of operational stages of development

Operational

13.70 The Waste Authority recognises the importance of waste segregation for domestic and non-domestic waste. Hence design and management procedures need to be considered as part of the development.

13.71 Hertfordshire County Council has facilities to collect waste and recycling separately.

13.72 In order to enhance the potential for recycling a range of mitigation measures will be proposed to include, for instance, the provision of facilities for recycling and composting, increasing the awareness of recycling opportunities and measures that relate to design.

13.73 The success of recycling will be dependent on the participation rates of the residents and employers and the success of the dissemination of information to educate and raise awareness.

Construction

Human health – demolition /construction workers and contractors

13.74 Any person working on the construction of the development has the capacity to come into contact with any contaminated soil or asbestos materials that has not be treated or disposed of correctly, which could create both immediate and long-term health problems.

13.75 The sensitivity of the receptor is high and the magnitude of change, is considered to be high as there is potential for the baseline to be materially changed. Therefore, there is likely to be a direct, short and/or long-term adverse effect prior to the implementation of mitigation measures.

13.76 Once the embedded mitigation measures, outlined in the mitigation section above, are implemented, the magnitude of change, is considered to be low, resulting in a minor adverse effect.

Waste collection, treatment and recycling facilities, non-hazardous and hazardous landfill sites

13.77 During the construction process there is the potential to create wastage of raw materials that may require off-site disposal. Some of the waste streams are likely to be generated during the construction of the building frame, internal fittings, electrical installations and external works (landscaping).

13.78 Prior to mitigation this would have an impact on depleting landfill capacity and increased transport and disposal costs as a result of the Landfill Directive.

13.79 The potential impact from the off-site disposal of waste generated from the proposed development could also result in increased traffic movements. If no recycling initiatives are implemented at the site, this will increase the off-site lorry movements and the amount of waste disposed of to landfill

13.80 Careful design of the site proposals should allow for a substantial proportion of the site arisings to be reused. The scale of reclamation is however limited by the substantial majority of the site being a greenfield site in its baseline condition.

13.81 The sensitivity of the receptor is high and the magnitude of change, is considered to be medium as there is potential for the baseline to be partially changed. Therefore, there is likely to be a direct, long-term adverse effect prior to the implementation of mitigation measures.

13.82 Once the embedded mitigation measures, outlined in the mitigation section above, are implemented, the magnitude of change, is considered to be low, resulting in a minor adverse effect.

Ground and water contamination

13.83 There is a potential for waste material to be abandoned or stored incorrectly with the leaching of the waste contaminants into the ground or run of into the drainage network. This has the ability to increase the risk of ground contamination and pollution of the nearby watercourses, resulting in a secondary contamination to the local ecology.

13.84 The sensitivity of the receptor is high and the magnitude of change, is considered to be high as there is potential for the baseline to be materially changed. Therefore, there is likely to be a direct, temporary short term adverse effect prior to the implementation of mitigation measures.

13.85 Once the embedded mitigation measures, outlined in the mitigation section above, are implemented, the magnitude of change, is considered to be medium, resulting in a moderate adverse effect.

Visual impact of the surrounding areas

13.86 There is the potential for waste, earthworks and construction materials to be piled in areas adjacent to roads and properties while construction works are ongoing

13.87 The sensitivity of the receptor is medium and the magnitude of change, is considered to be medium as there is potential for the baseline to be partially changed. Therefore, there is likely to be a direct, local, temporary, short term temporary adverse effect prior to the implementation of mitigation measures.

13.88 Once the embedded mitigation measures, outlined in the mitigation section above, are implemented, the magnitude of change, is considered to be low, resulting in a minor adverse effect.

Operational

Human health – residents

13.89 There is the potential for residents to come into contact with abandoned and untreated waste, which could create both immediate and long-term health problems.

13.90 The sensitivity of the receptor is high and the magnitude of change, is considered to be low as there is potential for the baseline to be partially changed. Therefore, there is likely to be a direct, short-term adverse effect prior to the implementation of mitigation measures.

13.91 Once the embedded mitigation measures, outlined in the mitigation section above, are implemented, the magnitude of change, is considered to be none, resulting in a negligible effect.

Waste collection, treatment and recycling facilities, non-hazardous and hazardous landfill sites

13.92 Direct production of excessive waste and potential failure to meet local and national targets for waste reduction and recycling through insufficient measures to enable appropriate recycling in employment premises of the development. The waste treatment and recycling facilities will need to be able to accept and readily process the expected types and volumes of waste anticipated.

13.93 The sensitivity of the receptor is high and the magnitude of change, is considered to be medium as there is potential for the baseline to be partially changed. Therefore, there is likely to be a direct, long-term adverse effect prior to the implementation of mitigation measures.

13.94 Once the embedded mitigation measures, outlined in the mitigation section above, are implemented, the magnitude of change, is considered to be low, resulting in a minor effect.

Ground and water contamination

13.95 There is a potential for waste material to be abandoned or stored incorrectly with the leaching of the waste contaminants into the ground or run of into the drainage network. This has the ability to increase the risk of ground contamination and pollution of the nearby watercourses, resulting in a secondary contamination to the local ecology.

13.96 The sensitivity of the receptor is high and the magnitude of change, is considered to be medium as there is potential for the baseline to be materially changed. Therefore, there is likely to be a direct, temporary short term adverse effect prior to the implementation of mitigation measures.

13.97 Once the embedded mitigation measures, outlined in the mitigation section above, are implemented, the magnitude of change, is considered to be medium, resulting in a moderate adverse effect.

Visual impact of the surrounding areas

13.98 There is the potential for waste to be abandoned and incorrectly disposed of, on the streets on within open green spaces.

13.99 The sensitivity of the receptor is medium and the magnitude of change, is considered to be high as there is potential for the baseline to be partially changed. Therefore, there is likely to be a direct, local, temporary short term adverse effect prior to the implementation of mitigation measures.

13.100 Once the embedded mitigation measures, outlined in the mitigation section above, are implemented, the magnitude of change, is considered to be low, resulting in a minor adverse effect.

Summary of environmental effects

Table 88: Significance of effect on waste related receptors

ENVIRONMENTAL RECEPTOR/RESOURCE	SENSITIVITY	MAGNITUDE OF EFFECT	SIGNIFICANCE OF EFFECT WITH MITIGATION
Human Health – Existing Site Users	High	Low	Minor adverse
Human Health – Demolition /Construction Workers , Contractors, Future Residents	High	Low	Minor adverse
Human Health – Future Residents	High	None	Negligible
Waste treatment and recycling facilities, non-hazardous and hazardous landfill sites	High	None	Minor adverse
Ground Contamination	High	Medium	Moderate adverse
Water Contamination	High	Medium	Moderate adverse
Visual Impact of the surrounding areas.	Medium	Low	Minor adverse

ACTIONABLE MITIGATION

13.101 No actionable mitigation measures have been identified.

RESIDUAL EFFECTS

13.102 With the mitigation described above, no significant adverse residual effects are anticipated.

CONCLUSION

13.103 This chapter has identified that the following sensitive receptors will be affected by the proposed development. The effects on human health, waste treatment and recycling facilities, ground and water contamination and visual impact, with suitable mitigation in the form of a Construction Environment Management Plan and Waste Management Plan are considered to be **minor adverse** for the most part save for risk to ground and water contamination where the risk is **moderate adverse**.

14 Climate change

14.1 This chapter of the ES concerns the likely significant environmental effects of the proposed development in relation to climate change. It has been compiled by Turley Sustainability and ESG.

14.2 It describes the technical consultation that has been undertaken during the EIA, the scope of the assessment and assessment methodology, and a summary of the baseline information that has informed the assessment. The assessment reports on the likely significant environmental effects and the mitigation measures required to prevent, reduce or offset significant adverse effects, or further enhance beneficial effects.

14.3 This chapter comprises two parts, Part 1 'Greenhouse Gas Emissions' ("GHG")' addresses the impact of the proposed development on climate change as a result of such emissions, and Part 2 'climate change resilience', which addresses the impact of climate change on the proposed development.

PART 1: ASSESSMENT METHODOLOGY

Study area

14.4 The site will form the principal study area for the assessment; however, the assessment will include off-site GHG emissions/savings such as those associated with the manufacture and transportation of construction materials, and those associated with the off-site generation (e.g., at a power station) of grid electricity consumed by the completed proposed development once occupied.

Consultation

14.5 No statutory consultee exists in relation to climate change, and as a result no consultation has been undertaken beyond the EIA Scoping process.

14.6 A Scoping Report (Appendix 1.1) was submitted in July 2024 and the Council's response (September 2024) which broadly agrees with the scope of the assessment proposed. However, it is requested that consideration is given to GHG emissions as a result of, 'transport and disposal of waste from construction activities'. This has therefore been included in the assessment below.

Legislative / planning policy context

14.7 UK Climate Change Act 2008[39] sets a legally-binding target for the UK to reduce its CO_2 emissions and was updated in 2019 to amend the target to reduce emissions to net zero by 2050.

14.8 Government's Net Zero Strategy (October 2021)[40] recognises the importance of the planning system to combating climate change and supporting sustainable growth.

14.9 The UK's Sixth Carbon Budget[41] was implemented in April 2021, enshrining in law a new target to reduce GHG emissions by at least 78% by 2035.

14.10 The NPPF (updated in 2023) seeks to encourage sustainable development by incorporating climate change mitigation and adaptation principles and measures to reduce GHG emissions within proposed development.

[39] HM Government (2019) UK Climate Change Act 2008 (2050 Target Amendment) Order 2019. Available at: https://www.legislation.gov.uk/uksi/2019/1056/introduction/made

[40] BEIS (2021). Net Zero Strategy: Build Back Greener. Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1033990/net-zero-strategy-beis.pdf

[41] BEIS (2021). Press Release: UK enshrines new target in law to slash emissions by 78% by 2035. Available at: https://www.gov.uk/government/news/uk-enshrines-new-target-in-law-to-slash-emissions-by-78-by-2035

14.11 The 2025 Future Homes Standard (FHS) and Future Buildings Standard (FBS) consultation[42] was published in December 2023 which requires homes to achieve a 75% carbon reduction beyond Part L 2013, removing the use of fossil fuel and requiring increased fabric efficiency and use of low carbon renewable energy generation.

14.12 Future Building Standard (FBS)[43] (2021) adopted in June 2022 requires that new non-residential development should achieve an average 27% CO_2 improvement on the Part L 2013 standard, it is anticipated that from 2025 new non-residential buildings will be required to achieve a similar carbon reduction as proposed for the 2025 FHS.

14.13 Environmental Impact Assessment ('EIA') Guide to: Assessing Greenhouse Gas Emissions and Evaluating their Significance (IEMA, 2022)[44] (IEMA's GHG Assessment Guidance) – provides guidance on the assessment of GHG emissions.

14.14 RIBA 2030 Climate Challenge V2 (2021)[45] - provides targets for embodied carbon and operational carbon emissions from new development from 2020 to 2030.

14.15 St Albans' current Local Plan was adopted in 1994 and does not include any specific policies related to energy and climate change mitigation. St Albans Draft Local Plan 2041, which is currently being developed, contains policies to promote sustainable development, including policies CE1 Promoting Sustainable Design, Construction and Building Efficiency and CE2 Renewable and Low Carbon Energy.

Assessment of process

14.16 There is at present no single accepted methodology for the assessment of GHG emissions within EIA. The proposed assessment methodology outlined below is therefore based on application of IEMA's GHG Assessment guidance, together with professional judgement.

14.17 Determining the magnitude and significance of climate change effects (GHG emissions or savings) from new development remains an emerging practice and is complex given the local scale at which GHG emissions typically occur in contrast to the global and transboundary nature of climate change.

14.18 In line with IEMA's GHG Assessment guidance, the approach taken in this assessment is to estimate GHG emissions resulting from the construction and operational phases of the proposed development and to evaluate these emissions in the context of baseline GHG emissions from the site, emissions from the local area (St Albans), Hertfordshire and East of England, as well as the future carbon budgets proposed for St Albans and the UK. The results will be considered in the context of the mitigation proposed and how this supports the UK Net Zero pathway.

14.19 Furthermore, and in accordance with IEMA guidance, consideration is also given to the contribution of the proposed development to a science-based net zero trajectory in line with the 2015 Paris Agreement's 1.5°C pathway[46].

14.20 The applied methodology therefore comprises the following components.

(1) Establish national and local legislation, policy and guidance relating to climate change mitigation.

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[42] Department for Levelling Up, Housing and Communities (2023). Available at: https://www.gov.uk/government/consultations/the-future-homes-and-buildings-standards-2023-consultation

[43] HM Government (2022) The Future Buildings Standard. Available at: https://www.gov.uk/government/consultations/the-future-buildings-standard

[44] EIA Guide to: Assessing Greenhouse Gas Emissions and Evaluating their Significance (IEMA, 2022). Available at: https://www.iema.net/preview-document/assessing-greenhouse-gas-emissions-and-evaluating-their-significance

[45] RIBA 2030 Climate Challenge V2 (2021). Available at: https://www.architecture.com/about/policy/climate-action/2030-climate-challenge

[46] IPCC (2019). Global warming of 1.5°C. Available at: https://www.ipcc.ch/site/assets/uploads/sites/2/2019/06/SR15_Full_Report_Low_Res.pdf

(2) Establish baseline conditions with respect to GHG emissions at the site, St Albans City & District Council, Hertfordshire and East of England.

(3) Establish future baseline conditions with respect to GHG emissions from future carbon budgets proposed for St Albans and the UK.

(4) Calculate GHG emissions resulting from the construction and operational phases of the proposed development.

(5) Calculate GHG emissions resulting from the transport and disposal of waste from construction activities.

(6) Evaluate inherent and standard GHG mitigation measures in place for the proposed development.

(7) Evaluate project's GHG emissions in the context of baseline emissions and future carbon budgets to establish their context and magnitude.

(8) Appraise the contribution of the proposed development to the UK's net zero trajectory.

(9) Establish whether actionable mitigation is required to reduce adverse effects or enhance beneficial effects.

(10) Establish the level of effect in relation to GHG and whether it is significant or not.

14.21 The timescales for the construction and operation phases of the Project are set out in Table 89.

Table 89: Assessed project timescales

DEVELOPMENT PHASE	FIRST YEAR	COMPLETION/ ASSESSMENT PERIOD	SUMMARY
Construction	2026	2036	The construction on replacement pitches is envisaged to commence in 2026, construction of the residential development is envisaged to commence in 2027 and development completion is estimated in around 2036. For the purpose of this assessment and to ensure the worst-case scenario, 10 years construction period is assumed (2026-2035).
Operation	2028	2037	First completions are envisaged in 2028/29 and it is estimated that the development will be fully operational in around 2036. For the purpose of this assessment and to ensure the worst-case scenario, the development is assumed to be fully operational from 2028. Operational phase GHG emissions are assessed up to the end of 2037 to enable comparison with UK carbon budgets ending 2037.

Assessment criteria

14.22 The assessment of likely significant environmental effects as a result of the proposed development has taken into account the construction and operational phases. The following sections define the approach adopted within the assessment for the determination of sensitivity (or value / importance), magnitude of change (or impact), and the level of effect and significance.

Determining the magnitude of change

14.23 The magnitude of change has been considered as the change experienced from the current baseline conditions at the sensitive receptor and has been considered on a scale of large, medium, small or negligible.

14.24 There are currently no published or agreed significance criteria for evaluating GHG emissions in EIA. Therefore, the magnitude of change of GHG emissions estimated from the proposed development is determined by establishing their scale relative to recent GHG emissions from St Albans City and District Council, Hertfordshire and East of England, and also to future St Albans and UK carbon budgets as presented in Table 90, together with professional judgement.

Table 90: Magnitude of impacts associated with GHG emissions

MAGNITUDE OF CHANGE	DESCRIPTION OF CHANGE
Large	A large increase/decrease in GHG emissions (>10%) relative to baseline emissions and/or future carbon budgets
Medium	A medium increase/decrease in GHG emissions (5% – 10%) relative baseline emissions and/or future carbon budgets
Small	A small increase/decrease in GHG emissions (1% – 5%) relative to baseline emissions and/or future carbon budgets
Negligible	A negligible increase/decrease in GHG emissions (<1%) relative to baseline emissions and/or future carbon budgets

14.25 The magnitude of GHG emissions (or savings) from a project, how this effect changes (or otherwise) baseline conditions and/or future carbon budgets at the local, regional and national level are also important components when establishing the magnitude of change. However, how much the project contributes (or otherwise) to the UK's net zero trajectory is a critical additional component as recognised by IEMA Guidance. This is factored into determining the magnitude of change using professional judgement.

Determining sensitivity of receptor

14.26 The sensitivity of affected receptors has been considered on a scale of high, medium, low or negligible.

14.27 GHG emissions affect the global climate system which, in accordance with IEMA guidance, is considered potentially sensitive to any additional GHG emissions. This sensitivity may, however, vary depending on the future global response to climate change, for example should a significant global reduction in GHG emissions (compared with the currently increasing emissions) be achieved over time. IEMA's latest EIA guide to climate change adaptation and resilience recommends the use of the Met Office UKCP18 high emissions scenarios (known as RCP8.5), unless the case can be made for using a different, lower emissions scenario. The RCP 8.5 scenario is considered most appropriate for this assessment and as a result the sensitivity of the global climate system is considered to be high.

Determining the significance of effect

14.28 The level of effect has been informed by the magnitude of change due to the proposed development and the evaluation of the sensitivity of the affected receptor. The level of effect has been determined using professional judgement and Table 91 has also assisted with this process. For each effect, it has been concluded whether the effect is 'beneficial' or 'adverse'.

Table 91: Determining the significance of effects of GHG emissions

MAGNITUDE	SENSITIVITY			
	HIGH	MEDIUM	LOW	NEGLIGIBLE
Large	Major	Major	Moderate	Minor
Moderate	Major	Moderate	Minor	Negligible
Small	Moderate	Minor	Minor	Negligible

Negligible	Minor	Negligible	Negligible	Negligible

14.29 The following terms (adapted from IEMA guidance) have been used to define the level of the effects.

(1) Major effect: GHG mitigation measures are not in line with a science-based 1.5°C aligned transition to net zero for that project type, and net GHG emissions equate to a large increase (e.g. ≥10%) relative to baseline local/regional/national emissions and/or future local carbon budgets. A project with major adverse effects is locking in GHG emissions and does not make a meaningful contribution to the national trajectory to net zero.

(2) Moderate effect: GHG mitigation measures are partly in line with a science-based 1.5°C aligned transition to net zero for that project type, and net GHG emissions equate to a small to medium increase (e.g.>5%) relative to baseline local/regional/national emissions and/or future local carbon budgets. A project with moderate adverse effects complies with some up-to-date policy and good practice but is locking in some emissions and makes only a partial contribution to the national trajectory to net zero.

(3) Minor effect: GHG mitigation measures are in line with a science-based 1.5°C aligned transition to net zero for that project type, and net GHG emissions equate to a small increase (e.g. <5%) relative to baseline local/regional/national emissions and/or future local carbon budgets. A project with minor adverse effects complies with up-to-date and emerging policy and good practice reduction measures and makes a contribution to the national trajectory to net zero.

(4) Negligible: GHG mitigation measures are in line with a science-based 1.5°C aligned transition to net zero for that project type, with minimal residual emissions. A project with negligible effects complies with up-to-date and emerging policy and best practice and plays a part in achieving the rate of transition required by nationally set policy e.g., net zero.

(5) Beneficial: net GHG impacts are below zero and the project results in a reduction in atmospheric GHG concentrations, whether directly or indirectly, compared to the without-project baseline. A project with beneficial effects substantially exceeds net zero requirements with a positive climate impact. It should be noted that the latest IEMA guidance on GHGs in EIA does not seek to differentiate between different levels of beneficial effect (minor, moderate, major) or whether they would be 'Significant/Not Significant'.

14.30 The duration of the effect has been assessed as either 'short-term', 'medium-term' or 'long-term'. Short-term is considered to be up to 1 year, medium-term is considered to be between 1 and 10 years and long-term is considered to be greater than 10 years.

14.31 Carbon dioxide equivalency (CO_2e) is a quantity that describes, for a given mixture and amount of GHG, the amount of CO_2 that would have the same global warming potential (GWP), when measured over a specified timescale (generally, 100 years). In view of this timescale and the findings of the Intergovernmental Panel on Climate Change (IPCC) 1.5°C Report that some effects from climate change may be long-lasting or irreversible, the duration of effect of the built elements of the proposed development is assumed to be long-term.

14.32 For each residual effect, a statement has been made as to whether the level of effect is 'Significant' or 'Not Significant'. This determination has been based on professional judgement and / or relevant guidance/legislation where applicable.

Sources of information

14.33 Table 92 summarises all studies undertaken to inform the assessment presented within this chapter.

Table 92: Background studies

STUDY	OVERVIEW	DATE OF COMPLETION
Outline Energy and Sustainability Strategy and associated modelling results prepared by Turley Sustainability and ESG	Provides options for an energy and climate change mitigation strategy for the proposed development, including annual energy demand (kWh).	June 2024

Assumptions

14.34 The components of the proposed development and associated assumptions are shown in Table 93.

Table 93: Components of the proposed development

LAND USE & QUANTUM	ASSUMPTIONS
Housing (up to 1,000)	Total of 86,830 sqm for both houses and flats is assumed, in accordance with the assumptions within the Outline Energy and Sustainability Strategy
Care home (80 beds)	An average bedroom of 25 sqm is assumed based on similar projects
Extra care provision (70 beds)	An average bedroom of 25 sqm is assumed based on similar projects
Local centre	2,000 sqm
Primary school	2,000 sqm

Assessment limitations

14.35 The assessment of the level of effect and whether the effect is 'significant' or not is based, in part, on professional judgement.

14.36 The future UK electricity grid factors sourced from BEIS are projections which may not reflect the actual emissions associated with grid electricity consumption in future. However, BEIS projections have slightly underestimated the rate of grid decarbonisation in recent years, so any inaccuracy in these projections may serve to over-estimate as well as under-estimate GHG emissions associated with the proposed development's future electricity demand.

14.37 Waste GHG emissions are based on an estimate of waste from construction which is based on construction industry reporting[47] and Government GHG reporting factors which include emissions from transport and disposal of waste streams[48]. Where specific emissions factors are not available the generic 'average construction' emissions factor gas been used. No specific data is available at this stage and construction amounts may vary, although as the GHG emissions are small in comparison to other construction stage GHG emissions this is not considered to be significant.

14.38 The completed and operational proposed development will generate additional vehicle trips on the local road network as a result of the operation of the site. However, it is very likely that the majority of these trips already occur on the UK network in some form. It is not possible to determine whether

[47] Qflow (2023) The UK Construction Industry Annual Waste Report 2023. Available at: Qflow Annual Waste Report 2023 (hubspotusercontent-na1.net)

[48] DESNZ (2024) Greenhouse gas reporting: Conversion factors 2024. Available tr: Greenhouse gas reporting: conversion factors 2024 - GOV.UK (www.gov.uk)

trips associated with the proposed development are truly 'Net New', it is therefore not possible to quantify the direct GHG emissions from transport associated with the proposed development. While it is not possible to directly quantify these emissions it is noted that it is the Government's aim to reduce emissions from vehicles, with the sale of fossil fuel based vehicles banned from 2030, currently in favour of electric vehicles which, with the decarbonisation of the electricity network, will reduce emissions to zero over time. A Transport Assessment and Travel Plan has identified sustainable transport measures to mitigate transport emissions from the proposed development.

PART 1: BASELINE CONDITIONS

The current baseline

14.39 The majority of the site currently comprises arable land in agricultural use and measures approximately 50 hectares in size. In the north west of the site are three playing fields, which are associated with Woollam Playing Fields. Whilst the existing Site may result in the release of GHG emissions, the scale of such GHG emissions is considered likely to be limited. For the purposes of the GHG emissions assessment, baseline GHG emissions from the site are assumed to be zero, an approach that helps ensure a reasonable 'worst-case' scenario regarding the GHG effect of the proposed development.

Local and regional GHG emissions

14.40 Table 81 presents the most recent (2021) data on baseline GHG emissions for St Albans administrative area, Hertfordshire and East of England as sourced from Government's UK Local Authority & Regional CO_2 Emissions Statistics[49]. Assumed baseline GHG emissions from the site are also presented. This baseline data is used to contextualise GHG emissions from the proposed development and determine the magnitude of change.

Table 94: Baseline site, local and regional GHG emissions

GEOGRAPHICAL AREA	2021 GHG EMISSIONS (TONNES CO_{2E})
Site	0
St Albans	896,651.1
Hertfordshire	5,967,356.4
East of England	38,062,590.1

The projected future baseline

14.41 The UK carbon budgets are effectively a future baseline of national GHG emissions necessary to achieve net zero. The Climate Change Act 2008 sets a 100% carbon reduction target (net zero) by 2050. It is the duty of the Secretary of State Department for Energy Security & Net Zero to set for each succeeding period of five years (beginning with the period 2008 – 2012) an amount for the net UK carbon account (the 'carbon budget') and to ensure the net quantity of emissions does not exceed the carbon budget. For this reason, it is reasonable to use these targets as an indicator of likely future baseline GHG emissions.

14.42 The UK's Sixth Carbon Budget was implemented in April 2021, enshrining in law a new target to reduce GHG emissions by at least 78% by 2035 and for the first time incorporating the UK's share of international aviation and shipping emissions.

[49] BEIS (2023). UK Local Authority and Regional Carbon Dioxide Emissions National Statistics: 2005 to 2021. Available at: https://www.gov.uk/government/collections/uk-local-authority-and-regional-greenhouse-gas-emissions-national-statistics

14.43 The Tyndall Centre has worked with St Albans to set future carbon budgets for their administrative area. The 'Setting Climate Commitments for St Albans' (June 2024)[50] report sets out proposed carbon budgets for St Albans up to the year 2100. It should be noted that these carbon budgets relate to emissions from the energy system only.

14.44 Table 95 presents the future carbon budgets set for the UK and St Albans to date which, together with current baseline GHG emissions reported above, are used to help determine the context and magnitude of future GHG emissions resulting from the proposed development.

Table 95: UK and St Alban carbon budget (tCO_2e)

PERIOD	UK	ST ALBANS
2018 - 2022	2,544,000,000	3,800,000
2023 - 2027	1,950,000,000	1,900,000
2028 - 2032	1,725,000,000	900,000
2033 - 2037	965,000,000	400,000
2038 - 2042	Not yet set	200,000
2043 - 2047	Not yet set	100,000
2048 - 2100	Not yet set	100,000

14.45 In order to determine whether the proposed development is aligned with and makes an appropriate contribution to the UK's net zero trajectory, it is necessary to provide context for the magnitude of GHG emissions. RIBA's 2030 Climate Challenge provides targets for embodied carbon and operational energy for domestic and non-domestic buildings to ensure the construction industry delivers the significant reductions necessary by 2030 in order to have a realistic prospect of achieving net zero for the whole UK building stock by 2050.

14.46 Table 96 sets out the future targets for operational energy use and embodied carbon for domestic and non-domestic buildings.

Table 96: RIBA's 2030 climate challenge targets

RIBA CLIMATE CHALLENGE METRICS	BUSINESS AS USUAL	2025 TARGETS	2030 TARGETS
Domestic / residential			
Operational Energy ($kWh/m^2/year$)	120	<60	<35
Embodied Carbon ($kgCO_2e/m^2$)	1,200	<800	<625
Non-domestic (new build offices)			
Operational Energy ($kWh/m^2/year$)	130	<75	<55
Embodied Carbon ($kgCO_2e/m^2$)	1,400	<970	<750
Non-domestic (new build schools)			
Operational Energy ($kWh/m^2/year$)	130	<70	<60
Embodied Carbon ($kgCO_2e/m^2$)	1,000	<675	<540

[50] Tyndall Centre (2024). Setting Climate Commitments for St Albans. Available at: https://carbonbudget.manchester.ac.uk/reports/E07000240/

14.47 Table 97 sets out environmental receptors and their sensitivity.

Table 97: Environmental receptor sensitive to greenhouse gas emissions

ENVIRONMENTAL RECEPTOR/RESOURCE	SENSITIVITY
Global climatic system	High

PART 1: INHERENT AND STANDARD MITIGATION

Construction phase

14.48 In order to ensure good practice mitigation in respect of construction carbon, a Whole Life Carbon Assessment (WLCA) of a typical building/house/flat will be undertaken during detailed design. This WLCA will assess and where possible reduce construction carbon through consideration of scheme design (e.g. slab thickness), construction materials, specifications and suppliers and with a particular focus on typical carbon 'hot spot' materials such as concrete and steel.

14.49 As a minimum buildings will be designed and built to achieve the RIBA 2030 Climate Challenge targets for 2025 as set out in Table 8.

14.50 A Construction Environmental Management Plan (CEMP) will be developed for the proposed development committing to a number of environmental mitigation measures to be adopted throughout the construction stage, including measures to support the reuse, recycling of waste, and limiting waste to landfill.

Operational phase

14.51 All homes and other buildings will be constructed to a high standard of fabric insulation and airtightness and will utilise a range of renewable energy technologies such as roof mounted solar PV and Air Source Heat Pumps. The development will be all-electric, with no gas boilers, meaning that the carbon intensity of each building will reduce over time, ultimately reaching net zero in line with the decarbonisation of the grid.

14.52 An Energy Strategy will be prepared for the proposed development demonstrating how homes will comply with the requirements of the anticipated 2025 Future Homes Standard, achieving as a minimum a 75% carbon reduction beyond Part L 2013. New non-residential buildings will meet the requirements of the Future Buildings Standard, including future iterations.

PART 1: ASSESSMENT OF ENVIRONMENTAL EFFECTS

Construction phase

14.53 The construction phase of the proposed development will result in GHG emissions both on- and off-site, from a range of activities including the manufacture of construction materials and products, the transport of materials and waste on- and off-site, the consumption of fossil fuels and electricity by site plant and vehicles, and the treatment of residual construction waste.

14.54 In order to estimate construction stage GHG emissions, performance in line with the 2025 targets from RIBA 2030 Climate Challenge of 800 $kgCO_2e/m^2$ is assumed for residential components, 970 $kgCO_2e/m^2$ for the local centre and 675 $kgCO_2e/m^2$ for the proposed primary school. These are applied to the assumed gross internal areas of the proposed buildings (sqm) as set out in Table 5 alongside the estimated waste transport and disposal emissions calculated based on industry data on construction waste and Government transport and waste disposal carbon factors.

14.55 Table 98 below presents annual and total construction phase GHG emissions calculated for the proposed development.

Table 98: Construction phase GHG emissions

ELEMENT	WASTE GHG EMISSIONS	TOTAL GHG EMISSIONS (TCO2E)	ANNUAL GHG EMISSIONS (TCO2E)
Residential development, including care home and extra care provision	18.36	72,482	7,248
Local centre	1.31	1,941	194
Primary school		1,351	135
Total		75,774	7,577

14.56 The construction phase of the proposed development is estimated to result in total emissions of 75,774 tCO_2e, equating to annual construction emissions of circa 7,577 tCO_2e across the 10 year construction period.

14.57 Table 99 presents construction emissions as a proportion of baseline emissions from St Albans, Hertfordshire and the East of England, and also future UK carbon budgets. Annual average construction emissions are used for comparison with baseline St Albans, Hertfordshire and East of England emissions (given these are also annual emissions), whilst total construction emissions are compared with UK carbon budgets for that period.

Table 99: Construction phase GHG emissions in context

CONTEXT	CONSTRUCTION GHG EMISSIONS (AS A %)
St Albans	0.85%
Hertfordshire	0.13%
East of England	0.02%
UK 4th Carbon Budget (2023 – 2027)	<0.01%
UK 5th Carbon Budget (2028 – 2032)	<0.01%
UK 6th Carbon Budget (2033 – 2037)	<0.01%

14.58 Annual construction emissions of 7,577 tCO_2e equate to circa 0.85% of St Albans, 0.13% of Hertfordshire and 0.02% of East of England baseline emissions. Total construction emissions of 75,774 tCO_2e equate to less than 0.01% of the UK carbon budget for each carbon budget period.

14.59 It should be noted that St Albans carbon budgets proposed by Tyndall Centre relate to emissions from the energy system only, whereas construction emissions from the proposed development will largely comprise those from the manufacture and transport of construction products and materials. Construction GHG emissions are therefore not readily comparable given a significant proportion of these emissions are likely to occur outside the geographical and/or temporal boundary of St Albans carbon budget.

14.60 Based on the above and the definitions set out in Table 90, Table 100 below sets out magnitude of change to environmental receptors.

Table 100: Magnitude of change to environmental receptor from GHG emissions

ENVIRONMENTAL RECEPTOR/RESOURCE	MAGNITUDE OF CHANGE
Global climatic system	Negligible

14.61 Performance in line with RIBA 2030 Climate Challenge targets for 2025 is considered to represent good practice regarding construction carbon and therefore the proposed development is considered to make an appropriate contribution to the UK net zero trajectory for this issue.

14.62 The sensitivity of the climate system is considered to be high. The magnitude of change is considered to be negligible. The proposed development's construction GHG emissions are considered to comprise current and emerging good practice and contribute to the UK's net zero trajectory. Therefore, there is likely to be a direct, temporary, long-term, adverse effect which is considered to be minor.

14.63 As shown in Table 101, this effect is considered to be not significant.

Table 101: Determining the significance of effects from GHG emissions

ENVIRONMENTAL RECEPTOR/RESOURCE	SENSITIVITY	MAGNITUDE OF EFFECT	SIGNIFICANCE OF EFFECT
Global climatic system	High	Negligible	Minor (Not significant)

Operational Phase

14.64 The Operational phase of the proposed development will result in GHG emissions from the generation of energy consumed by the proposed dwellings and non-residential development.

14.65 In order to estimate operational phase GHG emissions, annual energy demand of 2,881,430 kWh for the main residential components (houses and flats) is assumed in accordance with the Outline Energy and Sustainability Strategy Option 1 of the FHS, representing the worst-case scenario considered for the proposed development. This equates to 33 kWh/sqm/y.

14.66 Energy demand factors in line with the 2025 targets from RIBA 2030 Climate Challenge of 60 kWh/m^2/y is assumed for the remaining residential components (care home and extra care provision), 75 kWh/m^2/y for the local centre and of 70 kWh/m^2/y for the proposed primary school. These are assumed to be comparable to the anticipated FHS and FBS requirements.

14.67 Table 102 presents estimated operational phase GHG emissions for the first year of assumed occupation (2028), for the last year of the assessed period (2037) as well as emissions over the assessed period (2028 – 2037). As the assessment uses UK electricity grid factors which reflect the continued decarbonisation of the UK electricity grid, operational GHG emissions are anticipated to reduce over time, with emissions in year 1 representing the peak/worst-case.

Table 102: Operational phase GHG emissions

PHASE	OPERATIONAL PHASE GHG EMISSIONS (tCO_{2E})
Year 1 (2028)	211
Year 10 (2037)	61
Total (2028-2037)	1,152

14.68 The proposed development is estimated to result in GHG emissions of 211 tCO_2e during the assumed first year of occupation (2028), and 61 tCO_2e in 2037, and accumulating to 1,152 tCO_2e across the assessed assumed operational phase (2028 – 2037).

14.69 Table 103 presents operational emissions as a proportion of baseline emissions from St Albans, Hertfordshire and the East of England, and also future UK and local carbon budgets. In order to assess

the worst case scenario, peak annual operational emissions are used for comparison with baseline St Albans, Hertfordshire and East of England emissions, whilst cumulative operational emissions are compared with UK and local carbon budgets for that period.

Table 103: Operational phase GHG emissions in context

CONTEXT	OPERATIONAL GHG EMISSIONS (AS A %)
St Albans	0.024%
Hertfordshire	0.004%
East of England	0.001%
UK 5th Carbon Budget (2028 – 2032)	<0.001%
UK 6th Carbon Budget (2033 – 2037)	<0.001%
St Albans Carbon Budget (2028 – 2032)	0.089%
St Albans Carbon Budget (2033 – 2037)	0.087%

14.70 Peak annual emissions of 211 tCO_2e equate to circa 0.024% of St Albans annual emissions, 0.004% of Hertfordshire and 0.001% of East of England baseline emissions. Total emissions of 1,152 tCO_2e for the assessed assumed period equate to a maximum of 0.089% of St Albans carbon budgets (for 2028 – 2032) and less than 0.001% of UK carbon budgets.

14.71 Based on the above and the definitions set out in Table 90, Table 104 below sets out magnitude of change to environmental receptors.

Table 104: Magnitude of change to environmental receptor from GHG emissions

ENVIRONMENTAL RECEPTOR/RESOURCE	MAGNITUDE OF CHANGE
Global climatic system	Negligible

14.72 Table 105 presents operational GHG emissions for the main residential components (houses and flats) of the proposed development within the context of the RIBA climate challenge target metric for operational energy for domestic buildings.

Table 105: Operational GHG emissions in context of RIBA Climate Challenge Targets

RIBA CLIMATE CHALLENGE METRICS	BUSINESS AS USUAL	2025 TARGETS	2030 TARGETS	PROPOSED DEVELOPMENT
Operational Energy (kWh/m^2/year)	120	<60	<35	33

14.73 Estimated annual operational energy demand of 33 kWh/m^2 from the main residential components (houses and flats) of the proposed development exceeds the RIBA operational energy targets for 2030. Performance exceeding RIBA 2030 Climate Challenge targets for 2030 is considered to represent good practice regarding operational carbon.

14.74 In addition, performance in line with RIBA 2030 Climate Challenge targets for 2025 of the remaining components of the proposed development is considered to represent good practice regarding operational carbon and therefore the proposed development is considered to make an appropriate contribution to the UK net zero trajectory for this issue.

14.75 The sensitivity of climate system is considered to be high. The magnitude of change is considered to be negligible. The proposed development's operational GHG emissions are considered to comprise current and emerging good and best practice and contribute to the UK's net zero trajectory. Therefore, there is likely to be a direct, temporary, long-term, adverse effect which is considered to be minor.

14.76 As shown in Table 106, this effect is considered to be not significant.

Table 106: Determining the significance of effect of GHG emissions

ENVIRONMENTAL RECEPTOR/RESOURCE	SENSITIVITY	MAGNITUDE OF EFFECT	SIGNIFICANCE OF EFFECT
Global climatic system	High	Negligible	Minor (Not significant)

PART 1: ACTIONABLE MITIGATION

14.77 No actionable mitigation or enhancement is required for both construction and operational phase.

PART 1: RESIDUAL EFFECTS

14.78 In the absence of actionable mitigation the residual effect is the same as that reported within the pre-mitigation scenario.

Table 107: Residual effects of GHG emissions

ENVIRONMENTAL RECEPTOR/RESOURCE	SIGNIFICANCE OF RESIDUAL EFFECT
Construction Phase	
Global climatic system	(Minor) Not significant
Operational Phase	
Global climatic system	(Minor) Not significant

PART 1: CONCLUSION

Construction phase

14.79 The sensitivity of climate system is considered to be high. The magnitude of change is considered to be negligible. The proposed development's construction GHG emissions are considered to comprise current and emerging good practice and contribute to the UK's net zero trajectory. Therefore, there is likely to be a direct, temporary, long-term, adverse effect which is considered to be **minor**. This effect is considered to be Not Significant

Operational phase

14.80 The sensitivity of climate system is considered to be high. The magnitude of change is considered to be negligible. The proposed development's operational GHG emissions are considered to comprise current and emerging good practice and contribute to the UK's net zero trajectory. Therefore, there is likely to be a direct, temporary, long-term, adverse effect which is considered to be **minor**. This effect is considered to be Not Significant.

PART 2: ASSESSMENT METHODOLOGY

Study area

14.81 The study area for climate resilience refers to the impact of climate on the proposed development, therefore, the study area is the proposed development's site boundary.

Consultation

14.82 No statutory consultee exists in relation to climate change, and as a result no consultation has been undertaken beyond the EIA Scoping process.

Legislative / planning policy context

14.83 In addition to the policies identified in Part 1 of this assessment, EIA Guide to: Climate Change Adaptation & Resilience (IEMA, 2020)[51] (IEMA's Adaptation Guidance) – provides guidance on the assessment of climate change adaptation and resilience effects.

Assessment of process

14.84 The following approach is proposed for the climate change resilience assessment in accordance with IEMA's EIA Guide to Climate Change Adaptation & Resilience.

(1) Establish baseline climate conditions (e.g., monthly and annual average temperature and rainfall) for the site area from long term monitoring data from the closest Met Office automatic weather station.

(2) Review the Met Office's latest climate projections (UKCP18) for the site area to establish predicted changes to baseline temperature, rainfall and sea level for the 2030s (construction period) and 2050s & 2080s (future operational period) under the "high emissions scenario" (RCP8.5) in accordance with IEMA's guidance.

(3) Consideration of mitigation inherent to the design of the proposed development either required by legislation or guidance or included as part of a best practice design process.

14.85 The climate resilience assessment will consider the construction and operational phases of the proposed development.

Assessment criteria

14.86 The assessment of likely significant environmental effects as a result of the proposed development has taken into account the construction and operational phase.

14.87 The duration of the effect has been assessed as either 'short-term', 'medium-term' or 'long-term'. Short-term is considered to be up to 1 year, medium-term is considered to be between 1 and 10 years and long-term is considered to be greater than 10 years.

[51] EIA Guide to: Climate Change Adaptation & Resilience (IEMA 2020). Available at: https://www.iema.net/resources/reading-room/2020/06/26/iema-eia-guide-to-climate-change-resilience-and-adaptation-2020

Determining the magnitude of change

14.88 The magnitude of change has been considered as the change experienced from the current baseline conditions at the sensitive receptor and has been considered on a scale of large, medium, small or negligible.

Table 108: Magnitude of impact on climate

MAGNITUDE OF CHANGE	DESCRIPTION
Large	Ongoing annual impact with the potential for extreme events to cause operational or structural damage. For example, higher temperatures causing a major failure in structures or buildings with the potential for injury.
Moderate	Seasonal impact with the potential for climatic events to cause operational or structural damage. For example, increased summer maximum temperatures could affect structures through the movement of materials, foundations etc., or impact on building occupants through overheating.
Small	Increased maintenance required to mitigate annual operational impacts. For example, increased winter rainfall could cause damage to drainage systems resulting in additional maintenance requirements.
Negligible	Minimal impact, either positive or negative and likely to be mitigated through resilience measures included through regulatory or best practice.

Determining sensitivity of receptor

14.89 The sensitivity of affected receptors has been considered on a scale of high, medium, low or negligible.

14.90 In the case of the proposed development the most sensitive receptors are considered to be those where an impact may lead to a risk or injury to humans or that may constitute safety of critical infrastructure.

Table 109: Sensitivity of climate related receptors

SENSITIVITY OF REEPTORS	DESCRIPTION
High	Receptor has a high sensitivity to the climate effect and potential impacts, and/or, receptor includes safety critical infrastructure which if damaged could result in significant risks to people and/or property.
Medium	Receptor has a medium sensitivity to the climate effect and potential impacts and mitigation will need to be provided to protect infrastructure or building/site occupants. For example, without mitigation site infrastructure and operations may be at risk from increased winter rainfall and flooding.
Low	Receptor has a low sensitivity to potential climatic effects and mitigation is inherent to design, or unlikely to be required. For example, mitigation inherent to good practice construction will help mitigate the impacts of climate change through construction.
Negligible	Receptor not sensitive to climatic effects and mitigation not required.

Determining the significance of effect

14.91 The significance of effect has been informed by the magnitude of change due to the proposed development and the evaluation of the sensitivity of the affected receptor. The level of effect has been determined using professional judgement and Table 110 has been a tool which has assisted with this process.

Table 110: Significance of effects on climate related receptors

MAGNITUDE	SENSITIVITY			
	HIGH	MEDIUM	LOW	NEGLIGIBLE
Large	Major	Major	Moderate	Minor
Moderate	Major	Moderate	Minor	Negligible
Small	Moderate	Minor	Minor	Negligible
Negligible	Minor	Negligible	Negligible	Negligible

14.92 For each effect, it has been concluded whether the effect is 'beneficial' or 'adverse'.

14.93 The following terms have been used to define the level of the effects identified and these can be 'beneficial' or 'adverse'.

(1) Major effect: where the proposed development is likely to be exposed to a considerable change from the baseline conditions and the receptor has limited adaptability, tolerance or recoverability or is of the highest sensitivity;

(2) Moderate effect: where the proposed development is likely to be exposed to either a considerable change from the baseline conditions at a receptor which has a degree of adaptability, tolerance or recoverability or a less than considerable change at a receptor that has limited adaptability, tolerance or recoverability;

(3) Minor effect: where the proposed development is likely to be exposed to a small, but noticeable change from the baseline conditions on a receptor which has limited adaptability, tolerance or recoverability or is of the highest sensitivity; or where the proposed development is likely to be exposed to a considerable change from the baseline conditions at a receptor which can adapt, is tolerant of the change or/and can recover from the change; and

(4) Negligible effect: where the proposed development is unlikely to be exposed to a noticeable change at a receptor, despite its level of sensitivity or there is a considerable change at a receptor which is not considered sensitive to a change.

14.94 For each effect, a statement has been made as to whether the level of effect is 'Significant' or 'Not Significant', again based on professional judgement.

Sources of information

14.95 Table 111 summarises all studies undertaken to inform the assessment presented within this chapter.

Table 111: Background studies

STUDY	OVERVIEW	DATE OF COMPLETION
North St Albans – Ecology Summary prepared by FPCR Environment and Design Ltd	Provides details of the ecological surveys and findings completed on the site to date, as well as the recommended mitigation measures expected to be implemented as part of the proposed residential planning application	January 2024
Flood risk and drainage	Provides an assessment of the extent of flood risk and the surface water drainage strategy proposed as part of the development	December 2024

Assumptions

None.

Assessment limitations

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

14.97 The UK climate projections are dependent on future GHG emission assumptions. UKCP18 uses scenarios for future GHGs that are based on assumptions on future population, economic development and the mitigation of GHG emissions towards international targets. The real world may follow a different pathway altogether and the scientific community cannot reliably place probabilities on which scenario of GHG emissions is most likely. As outlined in the IEMA guidance, for the purposes of the assessment the 2080s RCP8.5 scenario has been considered as a worst case.

PART 2: BASELINE CONDITIONS

The current baseline

14.98 Current baseline climate condition for the application site area has been established from the Met Office's closest automatic weather station at Rothampsted[52] as set out below in Table 112. This shows current temperatures and rainfall patterns which are predicted to change as a result of climate change.

Table 112: Baseline climatic data

DESCRIPTION	BASELINE DATA
Summer maximum temperature (C)	22
Average summer rainfall (mm per month)	55
Average winter rainfall (mm per month)	60

The projected future baseline

14.99 For the UK, climate change is expected to lead to increasing annual temperatures, increasing winter rainfall and decreasing summer rainfall. Future baseline climate conditions for the application site area have been established from the Met Office's latest climate projections UKCP18 for the 25km OS grid square within which the site is located (515433, 209855) as presented in Table 25. Projected changes to seasonal and annual temperature and rainfall relative to the current Met Office baseline (1981-2010) climate conditions for Rothampsted are also presented.

14.100 These projections comprise predicted changes to baseline conditions for the UKCP18's "high emissions scenario" (known as RCP8.5) as recommended by IEMA's EIA guide to: Climate Change Resilience & Adaptation (2020). 50th percentile values are reported which means there is considered to be equal probability of a higher or lower observed value for that projection. As such these projections are considered to represent a reasonable worst case for the purposes of the EIA climate resilience assessment work.

[52] https://www.metoffice.gov.uk/research/climate/maps-and-data/uk-climate-averages/gcpwxz1ey

Table 113: Baseline climatic data

DESCRIPTION	2030S		2050S		2080S	
	CHANGE TO BASELINE	FUTURE BASELINE TEMP / RAINFALL	CHANGE TO BASELINE	FUTURE BASELINE TEMP / RAINFALL	CHANGE TO BASELINE	FUTURE BASELINE TEMP / RAINFALL
Summer maximum temperature (C)	1.16	23.0	2.13	23.9	5.75	27.5
Average summer rainfall (mm per month)	-3%	52.8	-17%	45.5	-36%	35.3
Average winter rainfall (mm per month)	5%	63.1	9%	65.4	20%	72.0

14.101 The UK Climate Projections provide guidance on the anticipated effects of climate change. Using these projections, the UK Climate Change Risk Assessment (UKCCRA) , updated in 2022, identifies potential risks and impacts of climate change across a number of areas including Infrastructure, Health, communities and the Built Environment. Key risks from the UKCCRA which potentially relate to the proposed development are summarised below.

(1) N1 – Risks to species and habitats from climate change;

(2) I2 – Risks for infrastructure from flooding;

(3) I7 – Risks to infrastructure from subsidence;

(4) H1 – Risks to health and wellbeing form high temperatures;

(5) H3 – Risks to people, communities and buildings from flooding;

(6) H5 – Risks to building fabric;

(7) H10 – Risks to water quality and household water supplies;

(8) B1 – Risks to businesses from flooding;

(9) B3 – Risks to business from water scarcity; and

(10) B5 – Risks to business operations due to high temperatures.

14.102 Based on the Climate Projections and risks from the UKCCRA, key likely receptors to be impacted by climate change include:

(1) Construction employees and site users may be impacted due to overheating from increasing temperatures;

(2) Site infrastructure may be impacted due to changing ground conditions and as a result of increased rainfall and flood risk;

(3) Construction operations may be impacted by changing weather patterns leading to risks of flooding, pollution and impacts on air quality from increasing temperature sand dry weather;

(4) Site habitats and species impacted by changing climate space; and

(5) Site operations, infrastructure and foundations and site users may be impacted by decreasing summer rainfall and water availability, as well as increased risks of flooding due to increasing winter rainfall.

14.103 Table 114 sets out environmental receptors and their sensitivity based on professional judgement and the Table 110 above.

Table 114: Environmental receptors and their sensitivity

CLIMATE HAZARD	POTENTIAL EFFECT	SENSITIVE RECEPTOR		
		CONSTRUCTION OPERATIONS; MATERIALS; SITE COMPOUNDS; PLANT AND EQUIPMENT SITE STRUCTURES SITE INFRASTRUCTURE	CONSTRUCTION EMPLOYEES END USERS	SITE HABITATS AND SPECIES
Precipitation	Decreasing summer rainfall	Low	Low	Low
	Increasing winter rainfall	Low	Low	Low
Temperature	Increasing annual and maximum summer temperatures	Low	Low	Low

PART2: INHERENT AND STANDARD MITIGATION

Construction phase

Changing annual temperatures / rainfall patterns and influence on human heath (construction employees), construction operations, site compounds, materials, plant and equipment

14.104 A Construction Environmental Management Plan will be prepared to support the construction of the proposed development and will set out climate change adaptation and measures as set out below.

(1) To reduce risks to human health from overheating such as provision of shaded refuges and potable water supplies during construction.

(2) To reduce risk to the site compounds and wider area from flooding, including appropriate measures such as raised levels, temporary drainage and pollution prevention systems.

(3) To reduce water use and pollution, including the monitoring and setting of targets for water reduction.

Changing annual temperatures / rainfall patterns and influence on site habitats and species

14.105 An Ecology Strategy will be developed which will set out measures to protect site species and habitats during construction period.

Operational phase

Changing annual temperatures / rainfall patterns and influence on site structure and site infrastructure

14.106 The Building Regulations[53] require new development to consider the impact of ground movement in foundation design. Changes to future climate including temperature and rainfall may cause ground conditions to change impacting site infrastructure and structures, therefore the proposed development will be designed in accordance with current guidance and best practice, and this will include the consideration of changing climate on stability of the ground conditions, influencing foundation design as necessary.

Higher average summer temperatures and risk of overheating (end users)

14.107 Part O of the Building Regulations[54] requires residential development to consider the effects of overheating, updated in 2021 to take better account of the potential effects of climate change.

14.108 Overheating will be considered during the detailed design of individual homes and buildings in accordance with the cooling hierarchy, which prioritises the use of passive cooling measures to minimise energy use. All residential development will demonstrate that the risk of overheating has been mitigated in accordance with Part O of the Building Regulations. Non-residential development will undergo overheating assessment, taking into account future climate scenarios.

14.109 The ventilation strategy for individual buildings will be confirmed at detailed design and consider measures to promote high levels of energy efficiency and good indoor air quality.

Changing annual temperatures / rainfall patterns and influence on site habitats and species

14.110 Green infrastructure proposals for the site will enhance and expand on existing assets to form a comprehensive green network that promotes biodiversity and mitigates the anticipated impacts of climate change in accordance with the England Biodiversity Strategy[55] and Natural England Climate Change Adaptation Manual[56].

14.111 A number of mitigation and enhancement measures have been proposed by FPCR as referenced in Chapter 6 and the associated appendices, which is currently being updated. An appropriate management plan will also be developed to ensure the long-term enhancement of the existing and new habitats.

14.112 In addition, the proposed development will aim to deliver a minimum 10% net gain in biodiversity.

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53 https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/540328/BR_PDF_AD_L2A_2013_with_2016_amendments.pdf

54 https://www.gov.uk/government/publications/overheating-approved-document-o

55 Biodiversity 2020: A strategy for England's wildlife and ecosystem services. Available at: https://www.gov.uk/government/publications/biodiversity-2020-a-strategy-for-england-s-wildlife-and-ecosystem-services

56 https://publications.naturalengland.org.uk/publication/5679197848862720

Increasing annual rainfall patterns and influence on site structures and infrastructure, end users and site habitats and species

14.113 The site is located entirely within Flood Zone 1, with a low probability of fluvial flooding (less than 0.1% chance of flooding in any year). In relation to surface water flooding, there is a very low to high risk of across the development site, primarily due to the topography of the site.

14.114 A Surface Water Drainage Strategy has been developed for the site to accommodate a 1- in 100-year flood event plus a 40% allowance for climate change.

14.115 The drainage strategy has been designed in accordance with the sustainable drainage (SuDS) hierarchy, which aims to mimic natural drainage systems, decrease flow rates to watercourses, and improve water quality, while also enhancing the biodiversity and landscape character of the site.

14.116 A variety of SuDS measures are proposed for the site, including SuDS basins (some of which will be lined in order to permanently hold water and provide wetland habitat), connecting swales, and permeable paving.

Decreasing annual rainfall patterns and influence on end users and site habitats and species

14.117 To reduce water use and provide resilience to reducing summer rainfall the development will include the following.

(1) All new dwellings will target a water efficiency standard of 110 l/p/d.

(2) Non-domestic uses will target a water efficiency standard of the equivalent of 2 Wat01 water efficiency BREEAM credits.

(3) The development will also consider the potential for rainwater harvesting to store water for irrigation of the development's green spaces.

PART 2: ASSESSMENT OF ENVIRONMENTAL EFFECTS

Construction phase

Determining the magnitude of change

14.118 Based on the baseline climatic data and professional judgement, Table 115 summarises the magnitude of change for the proposed development. The magnitude of change for each proposed development's component is considered to be the same throughout the site.

Table 115: Magnitude of change assessment for climate hazard

CLIMATE HAZARD	POTENTIAL EFFECT	MAGNITUDE OF CHANGE
Precipitation	Decreasing summer rainfall	Small
	Increasing winter rainfall	Small
Temperature	Increasing annual and maximum summer temperatures	Small

Determining the Level of effect and significance

14.119 Based on the Tables 114 and 115 above and professional judgement and taking into account the mitigation measures set out above, Table 116 determines the significance of the effects.

Table 116: Determining the significance of effects on climate related receptors

ENVIRONMENTAL RECEPTOR/RESOURCE	SENSITIVITY	POTENTIAL EFFECT	MAGNITUDE OF EFFECT	SIGNIFICANCE OF EFFECT
Construction operations; Materials; Site compounds; Plant and equipment	Low	Decreasing summer rainfall	Small	Negligible (Not Significant)
		Increasing winter rainfall	Small	Negligible (Not Significant)
		Increasing annual and maximum summer temperatures	Small	Negligible (Not Significant)
Construction employees	Low	Decreasing summer rainfall	Small	Negligible (Not Significant)
		Increasing winter rainfall	Small	Negligible (Not Significant)
		Increasing annual and maximum summer temperatures	Small	Negligible (Not Significant)
Site habitats and species	Low	Decreasing summer rainfall	Small	Negligible (Not Significant)
		Increasing winter rainfall	Small	Negligible (Not Significant)
		Increasing annual and maximum summer temperatures	Small	Negligible (Not Significant)

Operational phase

Determining the magnitude of change

14.120 Based on the baseline climatic data and professional judgement, Table 117 summarises the magnitude of change for the proposed development. The magnitude of change for each proposed development's component is considered to be the same throughout the site.

Table 117: Magnitude of change assessment for climate related receptors

CLIMATE HAZARD	POTENTIAL EFFECT	MAGNITUDE OF CHANGE
Precipitation	Decreasing summer rainfall	Moderate
	Increasing winter rainfall	Moderate
Temperature	Increasing annual and maximum summer temperatures	Moderate

Determining the level of effect and significance

14.121 Based on the Tables 110 and 117 above and professional judgement and taking into account the mitigation measures set out above, Table 118 determines the significance of the effects.

Table 118: Determining the significance of effects on climate related receptors

ENVIRONMENTAL RECEPTOR/RESOURCE	SENSITIVITY	POTENTIAL EFFECT	MAGNITUDE OF EFFECT	SIGNIFICANCE OF EFFECT
Site structures Site infrastructure	Low	Decreasing summer rainfall	Moderate	Minor adverse (not significant)
		Increasing winter rainfall	Moderate	Minor adverse (not significant)
		Increasing annual and maximum summer temperatures	Moderate	Minor adverse (not significant)
End users	Low	Decreasing summer rainfall	Moderate	Minor adverse (not significant)
		Increasing winter rainfall	Moderate	Minor adverse (not significant)
		Increasing annual and maximum summer temperatures	Moderate	Minor adverse (not significant)
Site habitats and species	Low	Decreasing summer rainfall	Moderate	Minor adverse (not significant)
		Increasing winter rainfall	Moderate	Minor adverse (not significant)
		Increasing annual and maximum summer temperatures	Moderate	Minor adverse (not significant)

PART 2: ACTIONABLE MITIGATION

14.122 No actionable mitigation or enhancement is required for both construction and operational phase.

PART 2: RESIDUAL EFFECTS

14.123 In the absence of actionable mitigation the residual effect is the same as that reported within the pre-mitigation scenario.

Table 119: Residual effects on climate related receptors

ENVIRONMENTAL RECEPTOR/RESOURCE	SIGNIFICANCE OF RESIDUAL EFFECT
Construction phase	
Construction operations; Materials; Site compounds; Plant and equipment	Negligible (Not Significant
Construction employees	Negligible (Not Significant
Site habitats and species	Negligible (Not Significant
Operational phase	
Site Structures & Infrastructure	Minor (Not Significant)
End users	Minor (Not Significant)
Site habitats and species	Minor (Not Significant)

PART 2: CONCLUSION

Construction phase

14.124 The sensitivity of environmental receptors is considered to be low. The magnitude of change is considered to be small. Therefore, there is likely to be a direct, temporary, long-term, adverse effect which is considered to be negligible. This effect is considered to be not significant.

Operational phase

14.125 The sensitivity of environmental receptors is considered to be low. The magnitude of change is considered to be moderate. Therefore, there is likely to be a direct, temporary, long-term, adverse effect which is considered to be minor. This effect is considered to be not significant.

15 Traffic and movement

15.1 This chapter of the ES concerns the likely significant environmental effects of the traffic arising from the proposed development. It has been compiled by PJA.

15.2 The chapter assesses the effect of development related traffic on (1) severance of communities, (2) road and vehicle driver and passenger delay, (3) non-motorised user delay, (4) non-motorised user amenity, and (5) fear and intimidation on and by road users and road user and pedestrian safety.

15.3 A Transport Assessment ("TA") has also been prepared to support the planning application which is included at Appendix 15.1. At various points this chapter cross refers to section of the TA to avoid repetition.

ASSESSMENT METHODOLOGY

Study area

15.4 The study area for this topic chapter has been established by reference to guidance contained within the Institute if Environmental Management and Assessment (IEMA) Environmental Assessment of Traffic and Movement (July 2023), hereafter referred to as the "IEMA Traffic and Movement Guidelines".

15.5 The IEMA Guidelines provide two broad rules-of-thumb that are used to define and delimit the geographical extent of the study area for assessment:

- **Rule 1**: Include highway links where traffic flows will increase by more than 30% (or the number of Heavy Goods Vehicles (HGVs) will increase by more than 30%); and
- **Rule 2**: Include highway links of high sensitivity where traffic flows will increase by 10% or more.

15.6 The IEMA Traffic and Movement Guidelines state that Rule 1 and Rule 2 may not be appropriate for some impacts and that it is generally accepted that they should not be applied to assessments of air quality, noise, road safety and driver delay. Noise and air quality effects are considered elsewhere in the ES (Chapters 16 and 17 refer). For road safety and driver delay, study areas were defined and agreed with the local highway authorities as part of the scoping discussions for the preparation of the Transport Assessment. The same study areas have therefore been adopted for this ES chapter. The IEMA Traffic and Movement Guidelines refer to traffic changes of less than 10% being within day-to-day variation and having no discernible environmental impact. Therefore, highway links experiencing less than 10% increase in traffic flows resulting from the proposed development have been scoped out of the assessment. Highly sensitive receptors are described at paragraph 15.35.

Consultation

15.7 The TA provides an overview of the consultation that has been undertaken with Hertfordshire County Council ("HCC") in its capacity as Local Highway Authority ("LHA") to inform the proposed development and EIA, including the consideration of likely significant effects and the methodology for assessment. A series of themed meetings have been held between January 2023 and August 2024 to discuss and agree key elements of the assessment methodology and present interim findings.

15.8 Further pre-application engagement has been undertaken with National Highways ("NH") as detailed at Section 1.3 of the TA which have helped to inform the assessment.

Legislative / planning policy context

15.9 There is no legislation relevant to the assessment presented within this chapter. The TA at Chapter 2 includes an overview of relevant national, regional and local planning policies and guidance which have been taken into account in the development of the scheme proposals and the assessment of effects. The National Planning Policy Framework (NPPF) at paragraph 108 states, "*Transport issues should be considered from the earliest stages of plan-making and development proposals, so*

that…the environmental impacts of traffic and transport infrastructure can be identified, assessed and taken into account – including appropriate opportunities for avoiding and mitigating any adverse effects, and for net environmental gains…."

Assessment of process

Approach to data collection and traffic forecasting

15.10 Baseline traffic flows across the local highway network surrounding the site have been established by the TA through a combination of primary data collection in the form of junction turning counts, automatic traffic counts and multi-modal surveys. In addition, data available from Department for Transport (DfT) traffic count sites has been referred to.

15.11 The TA has been prepared in line with emerging policy and guidance considering potential uncertainties in future trends relating to car usage.

15.12 For the purposes of establishing future baseline conditions against which the operation and construction traffic effects have been assessed, TEMPRO has been used to generate traffic growth factors for 'core' and 'aspirational' scenarios as detailed in Chapter 9 of the TA. The 'core' scenario reflects central rates of population, employment and Gross Domestic Product ("GDP") growth, whereas the 'aspirational' scenario considers increased flexible working, online shopping and a reduction in car driver licence holding among younger cohorts. In addition, forecast traffic flow changes associated with a number of committed schemes have been taken account of.

15.13 The TA also considers the potential for different levels of modal shift in both background and development traffic resulting from infrastructure interventions. As with the 'core' future baseline, the 'core' development scenario reflects the typical historical approach to traffic generation assuming car usage is dominant with no modal shift. The various modal shift scenarios reflect estimates of a reduction in vehicle trips with a shift to active travel modes.

15.14 Within this ES chapter, a robust assessment has been undertaken using the 'core' scenarios for both the Future Year Baseline and also the Development traffic estimates.

Construction phase

15.15 Consideration has been given to the potential for significant effects from the following impacts that will occur during demolition and construction:

Demolition and construction motor vehicle traffic volume and classification

15.16 The broad rules-of-thumb set out in the IEMA Traffic and Movement Guidelines for defining and delimiting the geographical extent of the study area comprise the inclusion of highway links where traffic flows are forecast to increase by more than 30%, or on links of high sensitivity by virtue of proximity to sensitive receptors where traffic flows are forecast to increase by more than 10%.

15.17 The assessment of construction effects has been made against the future baseline established by the 'core' scenario.

Operational phase

15.18 Consideration has been given to the potential for significant effects from the following impacts that will occur during the operational phase:

Volume and classification of motor vehicle traffic generated by new land uses.

15.19 The broad rules-of-thumb set out in the IEMA Traffic and Movement Guidelines for defining and delimiting the geographical extent of the study area comprise the inclusion of highway links where the proposed development is forecast to increase traffic flows by more than 30%, or on links of high sensitivity by virtue of proximity to sensitive receptors where traffic flows are forecast to increase by

more than 10%. Operational traffic flows have been established from the assessment work undertaken within the TA. The traffic impact during the operational phase has been assessed against the future base 'core' scenario as described above using the 'core' development traffic estimates.

Assessment criteria

15.20 The IEMA Traffic and Movement Guidelines identify a number of criteria against which the transport environmental impacts of a new development should be assessed; (1) severance of communities, (2) road vehicle driver and passenger delay, (3) non-motorised user delay, (4) non-motorised user amenity, (5) fear and intimidation on and by road users, road user and pedestrian safety and (6) hazardous/large loads.

15.21 The proposed development is not expected to give rise to any hazardous loads during its operation nor during its construction. Hazardous loads are therefore not considered relevant and have not been assessed in the ES.

15.22 Severance of communities is defined by the IEMA Traffic and Movement Guidelines as, "the perceived division that can occur within a community when it becomes separated by major transport infrastructure." The Guidelines go on to present indicators used for determining the significance of severance originally established by the Department for Transport (DfT). The indicators are changes in traffic flow of 30%, 60% and 90% that are regarded as producing slight, moderate and substantial changes in severance respectively.

15.23 Non-motorised User Delay is closely related to severance and the IEMA Traffic and Movement Guidelines advise that the two effects can be grouped together. In addition to volume of traffic, the ability for non-motorised users to cross roads (delay) can also be affected by changes in the volume, composition and speed of traffic. The assessment of delay on non-motorised users has been informed by the professional judgement of the assessor, which is commonplace.

15.24 Road vehicle driver and passenger delay has been informed by junction capacity assessment undertaken as part of the TA, with the assessment of significance informed by professional judgement.

15.25 Non-motorised user amenity is defined as the relative pleasantness of a journey and is affected by factors such as traffic flow and composition; footway width; and separation from traffic. The IEMA Traffic and Movement Guidelines state that the definition also includes fear and intimidation on and by road users and is a much broader category considering exposure to air and noise pollution and the overall relationship between non-motorised users and traffic. Earlier Guidelines for the Environmental Assessment of Road Traffic suggested a threshold for judging the significance of changes in amenity being when traffic flow, or its HGV component, is halved or doubled. These have not been superseded and the IEMA Traffic and Movement Guidelines suggest they form a starting point for the assessment.

15.26 Road user and pedestrian safety draws upon the assessment of collision data undertaken within the TA at Section 3.8 to identify any clusters or trends which may be impacted by the proposed development.

Determining the level of effect

15.27 The assessment of likely significant effects considers the sensitivity of the receptor and the magnitude of change to determine significance. The level of effect attributed to each criteria has therefore been assessed based on the magnitude of change due to the proposed development and then sensitivity of the affected receptor. The level of effect has been based on of professional judgement and Table 3 which assisted with this process.

15.28 Whilst Table 5 provides ranges, the level of effect in this chapter is confirmed as a single level and not a range, informed by professional judgement. For each criterion it has been concluded whether the effect is 'beneficial' or 'adverse'.

15.29 The duration of the effect has been assessed as either 'short-term', 'medium-term' or 'long-term'. Short-term is considered to be up to 1 year, medium-term is considered to be between 1 and 10 years and long-term is considered to be greater than 10 years. The effects are considered to be permanent; longer term changes in travel behaviour have not been accounted and the effects are considered irreversible for the purpose of this assessment.

Sources of information

15.30 The assessment of effects within this chapter has drawn upon the content of the TA, including relevant guidance documents and site visit observations where necessary. In particular, the assessment draws upon traffic flow data as detailed at Section 3.7 of the TA.

Assumptions

15.31 This chapter has drawn upon the content of the TA which incorporates assumptions to forecast growth in background traffic, traffic volumes associated with the proposed development and its distribution across the highway network within the study area.

Assessment limitations

15.32 Traffic flow data for the construction phase of the proposed development is not available. Instead, the assessment of the construction phase draws upon a review of the forecast traffic flows on the highway network in the vicinity of the site in relation to the IEMA Traffic and Movement Guidelines rules-of-thumb and references construction traffic data for a nearby residential development extracted from its Construction Traffic Management Plan.

BASELINE CONDITIONS

15.33 Guidance on defining sensitive receptors for the purposes of applying Rule 2 as discussed at paragraph 15.5 is provided in the IEMA Traffic and Movement Guidelines. The guidelines identify the following list as special interests that should be considered when defining sensitive receptors: people at home, people at work, sensitive and/or vulnerable groups (including young age; older age; income; health status; social disadvantage; and access and geographic factors), locations with concentrations of vulnerable users (e.g. hospitals, places of worship, schools), retail areas, recreational areas, tourist attractions, collision clusters and routes with road safety concerns and junctions and highway links at (or over) capacity.

15.34 This list has informed the assessment of sensitive receptors along the key highway links in the vicinity of the application site. Specific sensitive receptors have been identified in Table 120 along links expected to be used by development traffic. The IEMA Traffic and Movement Guidelines provide further criteria to assist in determining the sensitivity for collusion clusters and junctions or highway links at capacity referring to discussions with the local highway authorities and modelling work undertaken within the TA. The TA work and baseline traffic surveys have been used to identify specific junctions at capacity.

15.35 The sensitivity of affected receptors has been considered on a scale of high, medium or low. These sensitivities are defined in Table 3 of the ES and are summarised in Table 120.

Table 120: Sensitive transport related receptors

ENVIRONMENTAL RECEPTOR/RESOURCE	SENSITIVITY	JUSTIFICATION
People at home on A1081 Harpenden Road south of the site access	Low	People at home would be sensitive to local changes in traffic flows.
Pupils of St Albans Girls' School	Low	The school is set back from the adjacent streets however pupils would need to cross to access the school and would be sensitive to local changes in traffic flows.
Pupils of Garden Fields JMI School	Low	The school is set back from the adjacent streets however pupils would need to cross to access the school and would be sensitive to local changes in traffic flows.
Pupils of Batchwood School	Low	The school is set back from the adjacent streets however pupils would need to cross to access the school and would be sensitive to local changes in traffic flows.
Pupils of St Albans High School for Girls	Low	The school is set back from the adjacent streets however pupils would need to cross to access the school and would be sensitive to local changes in traffic flows.
Bernard's Heath	Low	Locally important open space accessible to the public however most of the space is well set back from the highway. Members of the public would be sensitive to local changes in traffic when accessing Bernard's Heath.
A1081 within St Albans City Centre	Low	The A1081 forms one of the main retail streets within the city centre. People visiting the centre would be sensitive to local changes in traffic flows.
Residents of Dorant House	Low	Dorant House is set back from the key links within the study area however residents would need to cross streets to access local bus stops and other facilities and would be sensitive to local changes in traffic flows.
The Woollam Playing Fields and Old Albanians RFC	Low	Locally important sports facilities set back from A1081 and screened by vegetation on the boundary.
King William IV Signalised Junction	Low	The junction is locally significant on a number of highly trafficked routes within the north of St Albans and operates at capacity in peak periods.
Users of the PRoW footpath in the southeast of the site (Longspring Wood)	Low	A local route used for recreation and sensitive to local changes in traffic flows at its northern and southern extents.
Users of National Cycle Network Route 6 (NCN6)	Medium	NCN Route 6 provides a regional connection adjacent to the A1081 Harpenden Road and is therefore consider of medium sensitivity.
Ancient Briton Signalised junction	Medium	The junction is considered regionally important, being located on the A1081 which forms the primary route north from St Albans and operates at capacity in peak periods.
Beech Bottom Dyke	Medium	This feature is a Scheduled Ancient Monument used for leisure and recreation purposes and considered regionally important due to its designation.

BASELINE CONDITIONS

15.36 This section describes the prevailing conditions on the local highway network included within the assessment, in particular the locations of the sensitive receptors as identified in Table 120.

15.37 The site is located approximately 2.7km north of St Albans City Centre and 4.7km south of Harpenden.

15.38 The site is bounded to the south by the existing settlement of St Albans, St Albans Girls' School, and Valley Road Industrial Estate (also known as Porter's Wood). The southern boundary is formed by Longspring Wood which is an ancient woodland and Local Wildlife Site. A public right of way runs through this woodland and a permissive path has been formed along its northern edge. To the north and east there is countryside; to the north west are the Woollam Playing Fields and to the west are residential dwellings fronting Harpenden Road.

15.39 Sandridgebury Lane passes through the site between the east edge of the site and its south-west corner.

Sustainable travel facilities

Pedestrian

15.40 Generally, to the south and west, and within the established urban area of St Albans, there is continuous footway provision along most roads but within the site and in the more rural areas to the north and east, footway provision is more intermittent or absent, albeit augmented by a network of footpaths and bridleways.

15.41 Shared use facilities (for pedestrians and cyclists) and/or footways with street lighting feature continuously along the extent of the A1081 Harpenden Road between the Ancient Briton junction and the Hawkswick Bus Stops located just north of the Woollam Playing Fields access. The shared use path on the western side of the carriageway and footway on the eastern side vary in character between being directly adjacent to the carriageway, measuring approx. 2.5m in width near the Ancient Briton Junction and further north, decreasing to between 1.2m-1.9m and becoming segregated from the carriageway by grass verges. To the south of the petrol filling station, this shared use path terminates and the signed National Cycle Route 6 (NCN6) continues within the New Greens area. To the south of this on the A1081, the facility continues as a footway. Good pedestrian provision along the A1081 Harpenden Road, and Valley Road as a quieter route, will enable future site residents pedestrian access towards St Albans City Centre within an approximate 40 minute walk from the centre of the site.

15.42 Informal pedestrian crossings are provided at intervals along this part of the A1081 with dropped kerbs, colour-contrasted tactile paving and pedestrian refuge islands situated within the hatched central reserve of the carriageway. A signalised pedestrian crossing is also provided just south of the A1081 Harpenden Road / Sandridgebury Lane priority junction and St Albans Girls School with pedestrian guard railing on each approach to the crossing.

15.43 Further north from the bus stops, the footway provision is decreased to just the western side of the carriageway until the A1081 Harpenden Road reaches Harpenden.

15.44 Sandridgebury Lane, within the site extents is a single track country lane with no pedestrian facilities. As Sandridgebury Lane continues west, lit footway provision is introduced along the north-western side of the carriageway providing access to the residential frontages.

15.45 Adjacent to the entrance to the St Albans Girls School Sandridgebury Lane features pedestrian footways on both sides of the carriageway as the route continues west to the A1081 Harpenden Road. It is noted that there are no pedestrian crossings feature between the northern and southern sides of the carriageway until the junction with the A1081 where dropped kerbs but no tactile paving are provided to cater for the north-south desire line across the junction bellmouth.

15.46 Valley Road adjacent to the site's southern boundary is a single track country lane with no pedestrian provision. South of the site, Valley Road features a grade separated footway on the western side, providing access between Darwin Close and rear pedestrian entrance to St Albans Girls School. To the east of Valley Road, a PRoW passes through Longspring Wood. As Valley Road meets Darwin Close, a dropped kerb crossing is provided between the Valley Road footway and footways on the southern

side of Darwin Close, with street lighting provided along the route. Further south on Valley Road, footway provision alternates between provision on both sides of the carriageway and just one side. While dropped kerbs are provided at a number of locations along the route, there is no tactile paving.

15.47 The King William IV junction has signalised pedestrian crossings provided north-south across Beech Road and Marshalswick Lane, and east-west across both sides of the B651. An additional zebra crossing is provided at the north-eastern side of the junction across the left turn slip lane from B651 St Albans Road.

Cycling

15.48 There are some existing cycle facilities surrounding the site with a traffic-free portion of NCR6 located immediately opposite the site boundary on the western side of the A1081 Harpenden Road. NCR6 is a long-distance route spanning the length of England and locally connects St Albans to Harpenden and Luton to the north and Watford and the western extents of Greater London to the south.

15.49 At the western boundary of the site, along A1081 Harpenden Road, the NCR6 is provided as a shared use path for cyclists and pedestrians on the western side of the carriageway. Just south of the St Albans Service Station, NCR6 diverts from A1081 Harpenden Road into the New Greens area via a quieter on-carriageway route. Directional fingerpost signage is provided at turning points along the route to inform cyclists of the NCR direction, as well as shared use path repeater signs along the route.

15.50 The St Albans cycling map published by HCC sets out routes that have been suggested by local cyclists, mostly as quieter roads. This includes Sandridgebury Lane routing through the site boundary, Valley Road, Old Harpenden Road, Ellis Fields and routes through the New Greens area. Although, these suggested routes divert cycle traffic away from the northern approach to the Ancient Briton crossroad junction, instead suggesting Old Harpenden Road as a quieter route.

15.51 The circular St Albans Green Ring is accessible in the vicinity of the site, adjacent to the A1081 Harpenden Road south of the Ancient Briton junction. The Green Ring is a continuous walking and cycling route covering 10km around St Albans, providing cycle access to open spaces, heritage sites, schools, workplaces, leisure facilities and both of St Albans Railway Stations. The Green Ring encompasses traffic-free and mixed-traffic cycling provision.

Bus

15.52 There is a good network of existing bus services which operate adjacent to the site as shown in Figure 3-6 of the TA, including the 321/721 between Luton and Watford/Rickmansworth and the 653 between St Albans and Welwyn Garden City and Hatfield. The 721 service augments the 321 service in order to raise the frequency of services along this route to 4 per hour, and was recently introduced using Bus Service Improvement Plan funding.

15.53 Local stops are available along the A1081 Harpenden Road at the western boundary of the site and in the New Greens area to the west of the A1081, further stops are available at the southern boundary of the site along Valley Road and surrounding the King William IV Junction. The bus stops nearest to the site access on A1081 Harpenden Road are identified with a flag and pole with printed timetable information and raised kerbs. Further south on the Harpenden Road bus stops are provided with shelters, seating and live timetable information. In the New Greens area, a combination of bus stop infrastructure is provided with some just accommodating a flag and pole, while some have shelters with seating and live timetable information.

15.54 Table outlines the services available at the stops, all are located within a 20-minute walk of the site boundary.

Table 121: Bus Services

SERVICE	ROUTE	MON-FRI FREQUENCY	SATURDAY FREQUENCY	SUNDAY FREQUENCY
84	Potters Bar – St Albans	2 per day (school departures)	No service	No service
	St Albans – Potters Bar	2 per day (school departures)	No service	No service
305	Potters Bar – St Albans – New Greens – Sandridge	1 per day (school arrivals)	No service	No service
	Sandridge – New Greens – St Albans – Potters Bar	1 per day (school departures)	No service	No service
321 Sapphire	Luton – Harpenden – St Albans – Chiswell Green – Watford – Rickmansworth – Maple Cross	20 mins	20 mins	Hourly
	Maple Cross – Rickmansworth – Watford – Chiswell Green – St Albans – Harpenden – Luton	20 mins	20 mins	Hourly
357	Harpenden – Sandridge – St Albans – London Colney – Shenley – Borehamwood	1 per day (school)	No service	No service
	Borehamwood – Shenley – London Colney – St Albans – Sandridge – Harpenden	1 per day (school)	No service	No service
361	Gorston – Bricket Wood – St Albans – New Greens Estate	1 per day (school arrivals)	No service	No service
	New Greens Estate – St Albans –Bricket Wood – Gorston	1 per day (school departures)	No service	No service
653 Tigermoth	Welwyn Garden City – Hatfield – Smallford – St Albans – New Greens Estate	30 mins	30 mins	Hourly
	New Greens Estate – St Albans – Smallford – Hatfield – Welwyn Garden City	30 mins	30 mins	Hourly
721	Hemel Hempstead – Luton Town Centre	30 mins	No service	No service
	Luton Town Centre – Hemel Hempstead	45 mins	No service	No service

15.55 The 321 Sapphire/721 and 653 Tigermoth services are the most frequent and local services offering 15 to 30 minute frequencies, Monday to Saturday and an hourly frequency on Sundays. However, most of the remaining services operating in the vicinity of the site are infrequent, only providing one or two services per day in each direction primarily for local school access.

Surrounding highway network

15.56 The local roads surrounding the site vary in character with an A-Road bounding the west of the site, while routes to the south and east are residential or rural in nature. These are shown in Figure 3-9 of the TA and described in detail within this section.

15.57 The A1081 Harpenden Road routes north-south along the western boundary of the site and this is where the primary vehicle access to the site will be taken from. The route continues north from the

site to Harpenden and Luton, terminating at Luton Airport and south towards St Albans City Centre. The area of New Greens can also be accessed to the west of A1081 Harpenden Road via Green Lane, Francis Avenue and Batchwood Drive.

15.58 The A1081 Harpenden Road is a two-way carriageway with a hatched central reserve measuring approximately 9m in width. North of the site the route is subject to a 40mph speed limit, reducing to 30mph just south of the proposed site access location along the A1081 Harpenden Road. South of the potential site access location, the A1081 Harpenden Road continues south for around 1.1km to the Ancient Briton junction formed by the intersection of Harpenden Road with Batchwood Drive and Beech Drive. Areas of congestion along the A1081 corridor were noted as part of peak hour site observations, potentially explaining the 'keep clear' areas marked at the Sandridgebury Lane junction, and also found at the simple priority junctions between the A1081 Harpenden Road and Green Lane, Francis Avenue and Old Harpenden Road south of Sandridgebury Lane.

15.59 The Old Harpenden Road runs parallel to Harpenden Road between Green Lane and the Ancient Briton junction. The Old Harpenden Road is a cul-de-sac for motor vehicles which is subject to a 30mph speed limit. Vehicle and active travel access is provided via a simple priority junction near to the Ancient Briton junction and at the northern extent of Old Harpenden Road the former alignment of the road has a modal filter to enable active travel access only.

15.60 The Ancient Briton junction is a four-arm signalised crossroad junction, with no turning restrictions. A1081 Harpenden Road and Beech Road each have two lane approaches, with one lane for left and straight-ahead movements and a separate lane for right turning movements. There are signalised pedestrian crossings with a central kerbed refuge on each arm with colour contrasted, tactile paving on the entry / exit to each crossing. The junction operates with an all-red pedestrian phase which is called subject to demand. The current operation of the junction is over acceptable capacity thresholds with high levels of queuing and delays already experienced on the approaches.

15.61 Beech Road routes east-west to the south of the site between the Ancient Briton and the King William IV signalised junctions. Beech Road is a two-way carriageway, subject to a 30mph speed limit, with a hatched central reserve. The hatching often makes way for ghost island right turning lanes to side roads north and south of Beech Road, and to provide space for pedestrian refuges at two crossing points. Footways are segregated from the carriageway by a wide grass verge on each side of the road, with breaks to allow vehicular access onto driveways. The soft verges are regularly used for parking vehicles. There are no formal cycling provision on Beech Road.

15.62 The King William IV junction is formed as a staggered signalised, crossroad junction with priority controlled left turn slip roads on the northern and southern approaches to the junction. Advanced cycle stop lines (ASLs) feature on the B651 St Albans Road to the north, B651 Sandridge Road to the south and Beech Road signalised approaches to the junctions. ASLs are omitted on the Marshalswick Lane approach. Signal controlled pedestrian crossings are provided on all main arms of the junction supplemented by a zebra crossing on the B651 St Albans Road left turning slip lane. The left turn slip from Sandridge Road is subject to both signal control and priority control. The current operation of the junction is over acceptable capacity thresholds with high levels of queuing and delays already experienced at the junction.

Accessibility

15.63 Section 3.5 of the TA demonstrates that a wide range of local facilities can be accessed from the development site by walking and cycling without the need for use of a private car. A variety of amenities and key day to day facilities can also be found locally at the High Oaks and Beech Road Local Centres. St Albans City Centre can also be accessed within an approximate 35-minute walk or 15-minute cycle, providing a variety of amenities and facilities.

15.64 The site is therefore well located to maximise opportunities for trips to local facilities, key services, and transport interchanges (bus and rail) to be undertaken by walking, cycling and public transport and the package of actionable mitigation discussed subsequently seeks to enhance this accessibility by active modes and public transport.

Highway safety

15.65 Personal Injury Collision ("PIC") data has been obtained from HCC for the latest six-year period (2017 – 2023). The study area has been agreed with HCC and NH at the scoping stages. The NH scoping response required the 2020 assessment year to be omitted from the analysis due the COVID-19 pandemic and this has been taken account of within the analysis of the data.

15.66 A summary of the collisions by road, severity and sensitive user involvement is contained in Table 122: and also reviewed in detail at Section 3.8 of the TA.

Table 122: Personal Injury Collision Overview

ROAD / JUNCTION	SEVERITY				SENSITIVE USER INVOLVEMENT			
	SLIGHT	SERIOUS	FATAL	TOTAL	PEDS	CYCLIST	M / C	TOTAL
A1081 Harpenden Road / Batchwood Drive / Beech Road	2	3	0	5	1	0	2	3
A1081 Harpenden Road (north of Batchwood Drive junction)	4	2	0	6	1	2	2	5
A1081 Harpenden Road (south of Batchwood Drive junction)	2	0	0	2	0	1	0	1
Batchwood Drive	1	2	0	3	0	1	1	2
Beech Road	3	1	0	4	1	0	1	2
Valley Road	2	1	0	3	1	0	1	2
B651 St Albans Road	2	1	1	4	0	2	0	2
Marshalswick Lane	3	0	0	3	0	1	1	2
Sandridgebury Lane	0	1	0	1	0	1	0	1
Marshals Drive	4	0	0	4	0		1	1
Marshalswick Lane / Marshals Drive / B651	3	1	0	4	0	2	1	3
Total	26	12	1	39	4	10	10	24

15.67 Overall, the detailed analysis within the TA concludes that there are varying circumstances involved in the recorded collisions within the study area over the study period suggesting there are generally no inherent safety issues which would suggest that any additional vehicle movements associated with the proposed development would result in an increase in the frequency and/or severity of collisions.

Baseline traffic flows

15.68 The existing base flows on the local highway network in the vicinity of the proposed development have been considered.

15.69 Base traffic data has been calculated using a combination of MCCs, ATCs and DfT traffic data. Where necessary, TEMPro growth factors have been applied to account for background traffic growth between the survey periods and 2024 baseline period. For the purposes of the TA, a future year assessment has been conducted for 2028. 24-hour AADT base flows for 2028 are summarised in Table 123 for the key links on the local highway network. The TA identifies the road link numbers for reference purposes.

Table 123: 2022 Baseline AADT Flows

LINK NO.	LINK DESCRIPTION	VEHICLES	HGVS	HGV %
1	A1081 Harpenden Road (North of Site Access)	14371	291	2%
2	Site Access (Main Street)	0	0	0%
3	A1081 Harpenden Road (South of Site Access)	16655	393	2%
4	A1081 Harpenden Road (South of Ancient Briton)	11621	285	2%
5	Batchwood Drive	15000	117	1%
6	Beech Road	10394	127	1%
7	B651 St Albans Road	9701	69	1%
8	B651 Sandridge Road	7691	51	1%
9	Marshalswick Lane	12835	139	1%
10	Townsend Drive	1499	7	0%
11	A1081 Harpdenden Road (North of Ayres End Lane)	14731	351	2%
12	B487 Redbourn Lane	17630	No HGV Data	-
13	A4147 Bluehouse Hill	22956	No HGV Data	-
14	A1081 St Peters Street (South of Stonecross Junction)	12704	355	3%
15	Avenue Road	2347	35	1%
16	Lemsford Road	4998	55	1%
17	Beaconsfield Road	5576	113	2%
18	Alma Road	10503	196	2%
19	London Road (West of Mile House Lane)	13666	*172*	1%
20	Sandpit Lane	12567	No HGV Data	-
21	A5183 Holywell Road	7750	*126*	2%

NB. numbers in italics are estimated from nearby surveys

Future Baseline

15.70 The future baseline flows for the study area are summarised in Table 124 for the future assessment year of 2028. The assessment year has been defined based upon the TA criteria for the planning application and were agreed with the highway authorities at the pre-application stage. The traffic flows have been derived from the modelling outputs which have forecast traffic growth based upon committed development traffic and the application of NTEM factors to the base model scenarios.

Table 124: 2028 Reference case (without development) AADT flows

LINK NO.	LINK DESCRIPTION	VEHICLES	HGVS	HGV %
1	A1081 Harpenden Road (North of Site Access)	17321	309	2%
2	Site Access (Main Street)	0	0	0%
3	A1081 Harpenden Road (South of Site Access)	20723	419	2%
4	A1081 Harpenden Road (South of Ancient Briton)	13793	303	2%
5	Batchwood Drive	15961	125	1%
6	Beech Road	12044	135	1%
7	B651 St Albans Road	10584	74	1%
8	B651 Sandridge Road	8292	55	1%
9	Marshalswick Lane	13657	148	1%
10	Townsend Drive	1595	8	0%
11	A1081 Harpdenden Road (North of Ayres End Lane)	15675	374	2%
12	B487 Redbourn Lane	17630	No HGV Data	-
13	A4147 Bluehouse Hill	22956	No HGV Data	-
14	A1081 St Peters Street (South of Stonecross Junction)	12704	378	3%
15	Avenue Road	2497	37	1%
16	Lemsford Road	5318	58	1%
17	Beaconsfield Road	5933	120	2%
18	Alma Road	11175	209	2%
19	London Road (West of Mile House Lane)	13666	183	1%
20	Sandpit Lane	12567	No HGV Data	-
21	A5183 Holywell Road	7750	134	2%

INHERENT AND STANDARD MITIGATION

15.71 The following inherent and standard mitigation measures are proposed to be delivered in conjunction with the development of the application site:

Table 125: Inherent and standard transport mitigation measures

INHERENT MITIGATION	STANDARD MITIGATION
Delivery of a comprehensive network of active travel routes along key highway corridors and across the public open space.	Comprehensive travel plan supporting people in the use of more sustainable modes for journeys within the development and beyond.
Closure of Sandridgebury Lane through the site to motor vehicles.	Implementation of travel plan measures supporting active travel including cycle discount vouchers, cycle training, Dr Bike session and maps and other information related to walking and cycling.
Introduction of a new turning loop at the western end of Sandridgebury Lane.	Implementation of travel plan measures to encourage public transport use including free taster tickets and timetabling information.
Delivery of a new active travel route between Sandridgebury Lane and the Hertfordshire Way.	Preparation of a construction environment management plan / construction traffic management plan that would *inter alia* manage the effects of construction traffic during the construction phase of the proposed development and manage impacts on PRoWs adjacent to the site.
Provision of a mobility hub bringing together public transport interchanges with a range of other facilities including a cycle repair station, cycle parking, car club hub, cafe and toilets, parcel lockers and information boards.	
Residential cycle parking at 1 space per bedroom.	
Low levels of car parking. Emerging Local Plan policy suggests major development sites will need to develop site specific parking strategies. The details will be fixed at reserved matters stage but the principle will be to broadly set parking levels below general car parking standards for St Albans.	
New site access junction on Harpenden Road incorporating new north and southbound bus stops, pedestrian and cycle crossings of the site access and Harpenden Road and an upgrade to the NCN6 to provide a segregated bi-directional cycleway between site access and the limit of the works associated with the Sewell Park site access arrangements to the south	
New site access junction on Harpenden Road incorporating new north and southbound bus stops, pedestrian and cycle crossings of the site access and Harpenden Road and an upgrade to the NCN6 to provide a segregated bi-directional cycleway between site access and the limit of the works associated with the Sewell Park site access arrangements to the south	

15.72 These inherent and standard mitigation measures have been taken into account in the assessment of environmental effects.

ASSESSMENT OF ENVIRONMENTAL EFFECTS

15.73 This section presents the assessment of effects on transport resulting from the proposed development. First the construction phase is considered, followed by the operational phase of the development.

Construction phase

15.74 The site is anticipated to be built out over a 10-year period during which time there will be a mix of construction and development activities generating traffic on the local highway network. Construction traffic will include the movement of workers associated with the construction of infrastructure and development plots along with the movement of material in the form of importing and exporting materials.

15.75 The construction process will require a range of skills from general labourers and skilled operatives through to professional and management staff. It is envisaged that workers will originate from a variety of sources with the majority residing within Hertfordshire, with a core coming from nearby places including St. Albans, Harpenden, Hatfield, Luton and Hemel Hempstead.

15.76 The quantum of workers on Site at any one time will primarily depend on factors such as the timing of the primary infrastructure along with demand for the development proposals. The provision of infrastructure will include the construction of the internal highway network and drainage along with the installation of utilities. The development of individual plots will include the creation of the relevant accesses and car parking along with the erection of the buildings plus fit out.

15.77 The volume of construction HGVs will depend on the construction period, on the construction programme and phasing of the project. The site benefits from direct frontage on A1081 Harpenden Road from which construction vehicles will gain access. Contractors will be required to adhere to routing agreements along with likely measures included in a Construction Environmental Management Plan (CEMP) or Construction Traffic Management Plan (CTMP). This will include the restriction of HGV traffic along Sandridgebury Lane under the existing railway bridge to minimise impacts on the Network Rail asset.

15.78 The broad rules-of-thumb set out in the IEMA Guidelines for defining and delimiting the geographical extent of the study area comprise the inclusion of highway links where traffic flows or the number of heavy goods vehicles are forecast to increase by more than 30%, or links of high sensitivity by virtue of proximity to sensitive receptors where traffic flows are forecast to increase by more than 10%.

15.79 The application site is accessed from the A1081 Harpenden Road which has an AADT flow of circa 20,700 to the south of the site in the future base year of 2028 and around 17,300 to the north of the site. Table 126 summarises the traffic flow thresholds that would need to be exceeded on each link within the study area in reference to the IEMA Traffic and Movement Guidelines to trigger inclusion within this assessment.

Table 126: Proposed development (core scenario) AADT flows

LINK NO.	LINK DESCRIPTION	24HR AADT 2028 REFERENCE CASE (WITHOUT DEVELOPMENT)	IEMA RULE 1	IEMA RULE 2			
		VEHICLES	HGVS	30% TOTAL VEH	30% HGV	10% TOTAL VEH	10% HGV
1	A1081 Harpenden Road (North of Site Access)	17321	309	5196	93	1732	31
2	Site access (Main Street)	0	0	0	0	0	0
3	A1081 Harpenden Road (South of Site Access)	20723	419	6217	126	2072	42
4	A1081 Harpenden Road (South of Ancient Briton)	13793	303	4138	91	1379	30
5	Batchwood Drive	15961	125	4788	38	1596	13

LINK NO.	LINK DESCRIPTION	24HR AADT 2028 REFERENCE CASE (WITHOUT DEVELOPMENT)	IEMA RULE 1	IEMA RULE 2			
		VEHICLES	HGVS	30% TOTAL VEH	30% HGV	10% TOTAL VEH	10% HGV
6	Beech Road	12044	135	3613	41	1204	14
7	B651 St Albans Road	10584	74	3175	22	1058	7
8	B651 Sandridge Road	8292	55	2488	17	829	6
9	Marshalswick Lane	13657	148	4097	44	1366	15
10	Townsend Drive	1595	8	479	2	160	1
11	A1081 Harpdenden Road (North of Ayres End Lane)	15675	374	4703	112	1568	37
12	B487 Redbourn Lane	17630	No HGV Data	5289	-	1763	-
13	A4147 Bluehouse Hill	22956	No HGV Data	6887	-	2296	-
14	A1081 St Peters Street (South of Stonecross Junction)	12704	378	3811	113	1270	38
15	Avenue Road	2497	37	749	11	250	4
16	Lemsford Road	5318	58	1595	17	532	6
17	Beaconsfield Road	5933	120	1780	36	593	12
18	Alma Road	11175	209	3353	63	1118	21
19	London Road (West of Mile House Lane)	13666	183	4100	55	1367	18
20	Sandpit Lane	12567	No HGV Data	3770	-	1257	-
21	A5183 Holywell Road	7750	134	2325	40	775	13

15.80 Detailed information on the forecast vehicle movements throughout the construction phase and build-out of the proposed development is not available, however, a Construction Traffic Management Plan prepared for a residential development at north west Harpenden identifies 20 two-way HGV movements and 55 staff vehicle trips as an upper level per day during periods of road surfacing and concrete pours. For comparison purposes, it would be reasonable to assume that rates of construction/delivery of houses would be similar at the proposed development.

15.81 Staff vehicle trips would be expected to be undertaken by light vehicles. In reference to the 10% threshold identified by the IEMA Traffic and Movement Guidelines Rule 2 on all the links surrounding the site, 55 vehicle trips would fall well below the threshold requiring any further assessment. Light vehicle trips would be expected to disperse across the local road network within the vicinity of the site, further diluting any increases.

15.82 The level of HGV traffic would also fall below the 10% threshold identified by the IEMA Traffic and Movement Guidelines Rule 2 on the A1081 Harpenden Road to the north and south of the site access. HGVs would be expected to route to/from the site on the major roads, with routing typically controlled via the CEMP/CTMP and vehicle numbers dispersing from the site access. The links where a change of 20 HGV movements could trigger further assessment are generally lower order roads with residential properties and the CTMP would look to restrict the use of such routes. For this reason, no further assessment of the environmental impacts associated with traffic during the construction phase is considered necessary.

Operational phase

15.83 The broad rules-of-thumb set out in the IEMA Traffic and Movement Guidelines for defining and delimiting the geographical extent of the study area comprise the inclusion of highway links where the proposed development is forecast to increase traffic flows by more than 30%, or links of high sensitivity by virtue of proximity to sensitive receptors where traffic flows are forecast to increase by more than 10%.

15.84 Table 127 summarises the AADT traffic flows associated with the proposed development, assuming the 'core' scenario, presenting the percentage change over the 2028 reference case flows.

Table 127: Proposed development traffic flows (core scenario) AADT flows

LINK NO.	LINK DESCRIPTION	VEHICLES	% CHANGE
1	A1081 Harpenden Road (North of Site Access)	740	4%
2	Site Access (Main Street)	5410	-
3	A1081 Harpenden Road (South of Site Access)	4670	21%
4	A1081 Harpenden Road (South of Ancient Briton)	2179	16%
5	Batchwood Drive	1129	7%
6	Beech Road	1250	10%
7	B651 St Albans Road	715	6%
8	B651 Sandridge Road	193	2%
9	Marshalswick Lane	342	3%
10	Townsend Drive	197	11%
11	A1081 Harpdenden Road (North of Ayres End Lane)	740	5%
12	B487 Redbourn Lane	591	3%
13	A4147 Bluehouse Hill	974	4%
14	A1081 St Peters Street (South of Stonecross Junction)	1066	8%
15	Avenue Road	549	22%
16	Lemsford Road	549	10%
17	Beaconsfield Road	549	9%
18	Alma Road	549	5%
19	London Road (West of Mile House Lane)	549	4%
20	Sandpit Lane	772	6%
21	A5183 Holywell Road	230	3%

15.85 The data in 130 demonstrates that the proposed development is not forecast to generate an increase in traffic flows of more than 30% (IEMA Traffic and Movement Guidelines Rule 1) on any of the highway links that have been assessed within the vicinity of the site.

15.86 Table 128 reviews the forecast traffic flow changes on the links adjacent to the sensitive receptors.

Table 128: Changes in flows on links adjacent to sensitive receptors

ENVIRONMENTAL RECEPTOR/RESOURCE	SENSITIVITY	LINK NO.	% CHANGE	SCOPED IN/ OUT OF ASSESSMENT
People at home on A1081 Harpenden Road south of the site access	Low	3	21%	In
St Albans Girls' School	Low	3	21%	In
Garden Fields JMI School	Low	5, 10	7%, 11%	In
Batchwood School	Low	5, 10	7%, 11%	In
St Albans High School for Girls	Low	14	8%	Out
Bernard's Heath	Low	4	16%	In
A1081 within St Albans City Centre	Low	14	8%	Out
Dorent House	Low	3	21%	In
The Woollam Playing Fields and Old Albanians RFC	Low	1	4%	Out
King William IV Signalised Junction	Low	6-9	10%,6%, 2%, 3%	In
Users of the PRoW footpath in the southeast of the site	Low	N/A	N/A	-
National Cycle Network Route 6	Medium	1, 3, 11	4%, 21%, 5%	In
Ancient Briton Signalised junction	Medium	3-6	21%, 16%, 7%, 10%	In
Beech Bottom Dyke	Medium	3, 6	21%, 10%	In

15.87 From this analysis it is concluded that the following highway links require further detailed assessment due to the presence of sensitive receptors and the forecast changes in traffic flows exceeding the 10% threshold identified in the IEMA Traffic and Movement Guidelines Rule 2.

Table 129: Links requiring further detailed assessment

LINK NO.	LINK DESCRIPTION	VEHICLES	% CHANGE
3	A1081 Harpenden Road (South of Site Access)	4670	21%
4	A1081 Harpenden Road (South of Ancient Briton)	2170	16%
6	Beech Road	1250	10%
10	Townsend Drive	197	11%

Severance of communities and non-motorised user delay

15.88 The IEMA Traffic and Movement Guidelines refer to changes in traffic flow of 30%, 60% and 90% are regarded as producing slight, moderate and substantial changes in severance respectively. These

form the starting point for considering the potential impact of traffic flow changes on receptors. Table 129 indicates that the forecast changes in traffic along each of the links being assessed falls below the 30% level, less than “slight”.

15.89 The A1081 Harpenden Road to the south of the site access experiences one of the highest forecast changes in traffic associated with the proposed development at 22%. Due to the fact that the proposed development is largely residential in nature, no material changes to the composition of traffic are expected. The sensitive receptors on this link include people at home, pupils of St Albans Girls’ School, residents of Dorant House and users of NCN6. With the exception of users of NCN6, each of these receptors are considered of low sensitivity. Users of NCN6 are considered medium sensitivity due to the regional connection this route provides and its close proximity to the carriageway. Each of these receptors would be expected to generate demand to cross the A1081 Harpenden Road and consequently may experience an increased sense of severance due to the increase in traffic flow when accessing facilities on the other side of the road.

15.90 Puffin crossings are provided to the south of the junction with Sandridgebury Lane and at the Ancient Briton junction at the southern end of the link and an informal crossing with a central refuge island is located to the south of the petrol filling station aligning with the connection through to New Greens Avenue. There is around 400m between each of the existing crossings. A further toucan crossing is proposed in connection with the consented Sewell Park residential development between the petrol filling station and Petersfield. In addition, the site access designs incorporate a signal-controlled crossing and a refuge island crossing of the A1081 Harpenden Road to facilitate access between the site, NCN6 and bus stops on the northbound side of the carriageway. The carriageway width along this section of the A1081 Harpenden Road is around 7.3m with a single lane in each direction and a hatched central margin. Consequently, crossing informally may be challenging for many users, resulting in potential delay to non-motorised users who would need to travel north or south to the nearest formal crossing point, diverting from desire lines. There is no crossing provision in the immediate vicinity of the bus stops adjacent to Sandridgebury Lane. This may disproportionately affect residents of Dorant House for example who may be required to walk further to access the stops via the nearest crossing. The delays currently experienced would be expected to slightly increase as a result of the proposed development traffic with only the inherited and standard mitigation implemented.

15.91 The sensitivity of receptors on the A1081 Harpenden Road south of the site access is considered to be medium (taken as the most sensitive receptor on the link). The magnitude of change is considered to be low. Therefore, there is likely to be a direct, permanent, long-term, minor adverse effect.

15.92 The A1081 Harpenden Road to the south of the Ancient Briton Junction is forecast to experience a 17% increase in traffic flows as a result of the proposed development. Bernards Heath, an area of open space used by the public is located on this link and is identified as a sensitive receptor of low sensitivity.

15.93 The A1081 Harpenden Road along this link is a two-way single carriageway road with footway provision on both sides. The carriageway is approximately 7m in width. Signalised crossings are provided at the Ancient Briton junction at the northern extent of the link and in the centre of Bernards Heath woodland, around 500m to the south of the junction. Bernards Heath occupies the land to the east and west of the road along much of the link and consequently demand to cross is more focussed in the locations of the existing crossing provision which is already signalised. The magnitude of change resulting from the increase in traffic flows from the development is considered to be low.

15.94 The sensitivity of receptors on the A1081 Harpenden Road south of the Ancient Briton junction is considered to be low. The magnitude of change is considered to be low. Therefore, there is likely to be a direct, permanent, long-term, negligible adverse effect.

15.95 Beech Road is forecast to experience a 10% increase in traffic flows as a result of the proposed development. The King William IV junction is located at the eastern end of this link and is identified as a sensitive receptor of low sensitivity.

15.96 Beech Road is approximately 9m in width and has a central hatched section with regular right turn lanes provided. There are uncontrolled crossing facilities along the link with pedestrian refuges to aid crossing. There are also signal controlled crossing facilities integrated into the Ancient Briton and King William IV junctions at either end of the link.

15.97 The sensitivity of receptors on Beech Road is considered to be low. The magnitude of change is considered to be negligible. Therefore, there is likely to be a direct, permanent, long-term, negligible adverse effect.

15.98 Townsend Drive is forecast to experience an 11% increase in traffic flows as a result of the proposed development. There are two schools located along the link identified as sensitive receptors of low sensitivity.

15.99 The link is approximately 7m wide. There are no formal crossing facilities provided but background traffic flows are low.

15.100 The sensitivity of receptors on Townsend Drive is considered to be low. The magnitude of change is considered to be negligible. Therefore, there is likely to be a direct, permanent, long-term, negligible adverse effect.

Road vehicle driver and passenger delay

15.101 The development traffic impacts have been assessed at junctions across the local highway network. For the purposes of this ES chapter, two junctions have been identified as sensitive receptors due to operating at high levels of capacity in the baseline situation; King William IV signalised junction and the Ancient Briton signalised junction.

15.102 Based upon the detailed junction capacity assessment results presented in the TA, the King William IV and Ancient Briton signalised junctions operate at capacity in the 2022 base year peak hours, and experiences high levels of queuing and delay across all approaches in both peak hours. A scenario whereby the development proceeds only with the addition of the proposed inherent and standard mitigation has not explicitly been assessed within the TA due to the performance of junctions. It would be reasonable to assume that unmitigated, the impact on the Ancient Briton and King William IV signal junctions would result in a medium to high magnitude of change to the delays experienced by road vehicle drivers and passengers.

15.103 The sensitivity of vehicle occupants travelling through the Ancient Britton junction is considered to be medium. The magnitude of change is considered to be medium to high. Therefore, there is likely to be a direct, permanent, long-term, moderate -major adverse effect.

15.104 The sensitivity of vehicle occupants travelling through the King William IV junction is considered to be low. The magnitude of change is considered to be medium to high. Therefore, there is likely to be a direct, permanent, long-term, minor-moderate adverse effect.

Non-motorised user amenity and fear and intimidation on and by road users

15.105 The IEMA Traffic and Movement Guidelines suggest as a starting point a threshold for judging the significance of changes in amenity being when traffic flow, or its HGV component, is halved or doubled. In reference to the proposed development, this threshold is not forecast to occur on any of the links within the study area. However, amenity is also affected by traffic flow and composition, footway width and separation from traffic which are factors which affect fear and intimidation. The IEMA Traffic and Movement Guidelines provide a scoring system to quantify the magnitude of impact from changes in traffic flow and composition on fear and intimidation. This assessment has been conducted for the links associated with the sensitive receptors identified that are forecast to experience a greater than 10% change in traffic as summarised in Table 133.

Table 130: Magnitude of impact at sensitive receptors from changes in traffic flow

Link No.	Link Description	2028 Reference Case (Without Dev)						2028 Do Something (With Dev)						Magnitude of Impact
		18hr flow	Veh/hr	18hr HGV	Speed limit	Degree of hazard score	Level of Fear and Intimidation	18hr flow	Veh/hr	18hr HGV	Speed limit	Degree of hazard score	Level of Fear and Intimidation	
3	A1081 Harpenden Road (South of Site Access)	21804	1211	413	30	30	Moderate	27112	1506	413	30	30	Moderate	Negligible
4	A1081 Harpenden Road (South of Ancient Briton)	13603	756	299	30	20	Small	16195	900	299	30	20	Small	Negligible
6	Beech Road	14265	793	154	30	20	Small	15686	871	154	30	20	Small	Negligible
10	Townsend Drive	1955	109	49	30	10	Small	2179	121	14	30	10	Small	Negligible

15.106 The results of the assessment applying the methodology as set out in the IEMA Traffic and Movement Guidelines show that across all four of the links the magnitude of impact on fear and intimidation would be negligible.

15.107 The sensitivity of receptors across the study links is medium (taken as the most sensitive receptor on the links being assessed). The magnitude of change is considered to be negligible. Therefore, there is likely to be a direct, permanent, long-term, adverse effect which is considered to be negligible.

Road user and pedestrian safety

15.108 The assessment of road user and pedestrian safety has drawn upon the analysis undertaken within the TA and as summarised earlier in this chapter. The TA has analysed collision data obtained from HCC for the latest five-year period, excluding 2020 to limit any influence differing travel patterns in connection with the COVID-19 pandemic. The links experiencing greater than 10% change in traffic flows comprise the A1081 Harpenden Road to the south of the site access and south of the Ancient Briton junction as well as Townsend Drive and Beech Road.

15.109 The sensitive receptors on these links include people at home, pupils of St Albans Girls' School, pupils of the Garden Fields JMI School, pupils of the Batchwood School, residents of Dorent House, Bernards Heath, users of NCN6 and the Ancient Briton and King William IV junctions. With the exception of users of NCN6 and the Ancient Briton junction, each of these receptors are considered of low sensitivity. Users of NCN6 are considered medium sensitivity due to the regional connection this route provides and its close proximity to the carriageway. The Ancient Briton junction on the A1081 represents a junction on a link of regional significance and operates at capacity in peak periods. In addition, the King William IV junction which is at the intersection of Beech Road and Marshalswick Lane/St Albans Road/Sandridge Road operates at capacity in the peak periods.

15.110 On the links and junctions in question there were generally no fatal collisions over the five-year study period. There was a single fatal collision recorded on the St Albans Road approach of the King William IV junction.

15.111 On the A1081 Harpenden Road to the south of the site access six collisions occurred over the six-year period with two recorded as serious. There are some common characteristics with collisions involving vehicles turning right from the A1081 Harpenden Road. These collisions are spread across different junctions and a five-year period. There is no evidence of clustering of accidents from the data to indicate an inherent safety issue.

15.112 At the King William IV junction, four collisions were recorded over the study period. Three were recorded as slight in severity and one as serious in severity. The collisions had varying circumstances and there are no common movements suggesting an inherent safety issue at the junction. At the Ancient Briton junction, five incidents occurred either on or approaching the junction in the five-year study period. Three were recorded as serious in severity, and two as slight. One serious collision involved a pedestrian. All collisions had varying circumstances and there are no common movements suggesting an inherent safety issue at the junction.

15.113 To the south of the Ancient Briton junction two collisions were recorded during the five-year period assessed, both were classified as slight and occurred in different locations indicating no prevailing highway safety issue.

15.114 No collisions were recorded on Townsend Drive at its northern end.

15.115 The sensitivity of receptors across the study links is medium (taken as the most sensitive receptor on the links being assessed). The magnitude of change is considered to be low. Therefore, there is likely to be a direct, permanent, long-term, minor adverse effect.

Summary

15.116 The following tables summarise the results of the assessment taking into account the inherent and standard mitigation measures. The magnitude of change is taken as the greatest change experienced against the assessment criteria.

Table 131: Significance of effect at transport sensitive receptors

ENVIRONMENTAL RECEPTOR/RESOURCE	SENSITIVITY	MAGNITUDE OF EFFECT	SIGNIFICANCE OF EFFECT
People at home on A1081 Harpenden Road south of the site access	Low	Medium	Minor
Pupils of St Albans Girls' School	Low	Medium	Minor
Pupils of Garden Fields JMI School	Low	Low	Negligible
Pupils of Batchwood School	Low	Low	Negligible
Bernard's Heath	Low	Low	Negligible
Dorent House	Low	Medium	Minor
Users of the PRoW footpath southeast of the site	Low	None	Negligible
National Cycle Network Route 6	Medium	Medium	Moderate
Ancient Briton Signalised junction	Medium	Medium	Moderate
King William IV Signalised Junction	Low	Medium	Minor
Beech Bottom Dyke	Medium	None	Negligible

ACTIONABLE MITIGATION

15.117 The following actionable mitigation is proposed in association with the proposed development as summarised in Table 132.

Table 132: Actionable transport mitigation measures

ACTIONABLE MITIGATION	BENEFICIAL EFFECTS
Delivery of improvements to form a shared footway/cycleway between the site access and the Woollam Playing Fields to the north.	Enhanced accessibility for pedestrians and cyclists to the playing fields, providing and improving the separation from vehicular traffic on the A1081 Harpenden Road addressing fear and intimidation.
Delivery of improvements to the active travel link between A1081 Harpenden Road and New Greens Avenue	Network connectivity benefit for active travel users.
Introduction of modal filter preventing use of Valley Road by motor vehicles	Network connectivity benefit for active travel users, reducing fear and intimidation from road traffic to encourage increased levels of walking and cycling.
Delivery of traffic management scheme proposed along Valley Road between Darwin Close and Beech Road	Network connectivity benefit for active travel users, reducing fear and intimidation from road traffic to encourage increased levels of walking and cycling.
Delivery of temporary traffic calming measures on Sandridgebury Lane to manage conflict between current users of the lane and new active travel journeys towards Valley Road.	Network connectivity benefit for active travel users, reducing fear and intimidation from road traffic to encourage increased levels of walking and cycling.

ACTIONABLE MITIGATION	BENEFICIAL EFFECTS
Works to the Ancient Briton and King William IV junctions to improve pedestrian and cyclist amenity and maximise capacity.	Enhanced provision for pedestrians and cyclists to reduce non-motorised user delay and address severance.
Improvements to National Cycle Route 6 connection through Bernards Heath woods	Network connectivity benefit for active travel users, reducing fear and intimidation from road traffic to encourage increased levels of walking and cycling. Measures are forecast to increase active travel mode share for development and background trips reducing fear and intimidation from road traffic.
Delivery of measures forming Active Travel route 1B linking towards the hospital	Network connectivity benefit for active travel users, reducing fear and intimidation from road traffic to encourage increased levels of walking and cycling. Measures are forecast to increase active travel mode share for development and background trips reducing fear and intimidation from road traffic.
Delivery of measures forming Active Travel route 3 linking towards Marshalswick	Network connectivity benefit for active travel users, reducing fear and intimidation from road traffic to encourage increased levels of walking and cycling. Measures are forecast to increase active travel mode share for development and background trips reducing fear and intimidation from road traffic.
Provision of funding to support LHA development of design proposals and the delivery of schemes south of Sandpit Lane and Avenue Road (Active Travel Routes 1a and 2)	Network connectivity benefit for active travel users, reducing fear and intimidation from road traffic to encourage increased levels of walking and cycling. Measures are forecast to increase active travel mode share for development and background trips reducing fear and intimidation from road traffic.
Introduction of modal filters preventing use of Sandridgebury Lane by motor vehicles	Network connectivity benefit for active travel users, reducing fear and intimidation from road traffic to encourage increased levels of walking and cycling.
Delivery of turning facility adjacent to modal filter at the west end of Sandridgebury Lane	Highway safety measure to facilitate vehicles turning within the carriageway space.
Installation of permanent traffic counter within Sandridgebury Lane to enable traffic flow levels to be monitored as part of the monitor and manage proposals. Should traffic volumes increase significantly mitigation will be triggered which would look to introduce a prohibition of motor vehicles on Sandridgebury Lane.	The monitor and manage strategy for Sandridgebury Lane aims to protect the character of the lane as a rural active travel route used by pedestrians, cyclists and equestrians, reducing fear and intimidation from road traffic to encourage increased levels of walking and cycling.
Construction of new active travel route between Sandridgebury Lane and the Hertfordshire Way	Enhanced accessibility for pedestrians, cyclists and equestrians. Network connectivity benefit for active travel users, reducing fear and intimidation from road traffic to encourage increased levels of walking and cycling.
Extension of Bus route 653 from New Greens to the on-site mobility hub	Accessibility enhancement which will overcome issues of severance and fear and intimidation associated with crossing the A1081 to access bus stops.

RESIDUAL EFFECTS

15.118 This section assesses the residual effects following consideration of the actionable mitigation. The assessment has been informed by the TA which includes the results of junction capacity testing for a 2033 future year with and without the proposed development, and scenario testing of the potential range of modal shift and associated impacts of the package of actionable mitigation.

Operational phase

Severance of communities and non-motorised user delay

15.119 An extensive package of off-site mitigation measures is proposed that collectively will target reductions in severance and fear and intimidation that non-motorised users may otherwise experience. These measures will benefit existing users in addition to new users associated with the proposed development. Specifically, on the A1081 Harpenden Road to the south of the site access improvements are proposed to deliver a continuous segregated cycle route between the site and the uni-directional infrastructure proposed by the Sewell Park residential development. Improvements are also proposed at the Ancient Briton and King William IV junction to the existing pedestrian crossings and to introduce cycle crossing provision, providing segregation for these modes and reducing delay for users. Additional crossing points on the A1081 Harpenden Road are also proposed which will address severance and delay currently experienced.

15.120 Taking account of the actionable mitigation proposed, the sensitivity of receptors on the A1081 Harpenden Road south of the site access is considered to be medium (taken as the most sensitive receptor on the link). The magnitude of change is considered to be low. Therefore, there is likely to be a direct, permanent, long-term, minor adverse effect.

15.121 Cycle infrastructure improvements are proposed to NCN6 adjacent to the A1081 Harpenden Road to the south of the Ancient Briton junction.

15.122 Taking account of the actionable mitigation proposed the sensitivity of receptors on the A1081 Harpenden Road south of the Ancient Briton junction is considered to be low. The magnitude of change is considered to be low. Therefore, there is likely to be a direct, permanent, long-term, negligible adverse effect.

15.123 There are no changes proposed directly to the Beech Road corridor in terms of active travel improvements, there are however proposals to improve active travel movements through the King William IV junction. The wider active travel improvements are also forecast to reduce vehicle trips along this corridor. Taking account of the actionable mitigation proposed the sensitivity of receptors on Beech Road is considered to be low. The magnitude of change is considered to be low. Therefore, there is likely to be a direct, permanent, long-term, adverse effect which is considered to be negligible.

15.124 Cycle infrastructure improvements are proposed along Townsend Drive. Taking account of the actionable mitigation proposed the sensitivity of receptors on Townsend Drive is considered to be low. The magnitude of change is considered to be low. Therefore, there is likely to be a direct, permanent, long-term, negligible adverse effect.

Road vehicle driver and passenger delay

15.125 The package of actionable mitigation measures comprises a number of measures targeting increases in the background mode share of walking, cycling and public transport trips, thereby offsetting the additional vehicle trips forecast in connection with the proposed development. In relation to road vehicle driver and passenger delay, improvements are also proposed at the Ancient Briton and King William IV signalised junctions.

15.126 The TA has assessed the impact of the proposed development following implementation of the actionable mitigation package. Impacts are typically identified on the Beech Road and Batchwood Drive approaches in the morning peak where queues and delays are forecast to increase. Impacts are more limited on the Harpenden Road approaches however, with the AM peak showing some potentially significant reductions in queuing and delay on this key public transport corridor into St. Albans. In the PM peak, there are increases in queues (but not delays) across all approaches but in the context of the existing operation, is not deemed to represent a severe impact. The TA concludes its assessment of the junction stating the proposed development impacts with the proposed improvement scheme and extensive off-site active travel network are adequately mitigated.

Furthermore, the benefits to active travel users in terms of safety, convenience and wellbeing should be noted.

15.127 Similarly, there are some impacts forecast at the King William IV junction following introduction of the proposed active travel improvements. In the context of the existing operation, it is not deemed to represent a severe impact. The TA concludes its assessment of the junction stating the proposed development impacts with the proposed improvement scheme and extensive off-site active travel network are adequately mitigated. Furthermore, the benefits to active travel users in terms of safety, convenience and wellbeing should be noted.

15.128 Taking account of the forecast impact of the package of actionable mitigation proposed the sensitivity of vehicle occupants travelling through the Ancient Briton junction is considered to be medium. The magnitude of change is considered to be low. Therefore, there is likely to be a direct, permanent, long-term, minor adverse effect.

15.129 Taking account of the forecast impact of the package of actionable mitigation proposed the sensitivity of vehicle occupants travelling through the King William IV junction is considered to be low. The magnitude of change is considered to be low. Therefore, there is likely to be a direct, permanent, long-term, negligible adverse effect.

Non-motorised user amenity and fear and intimidation on and by road users

15.130 The earlier assessment in advance of the consideration of the package of actionable mitigation identified an impact of medium magnitude on non-motorised user fear and intimidation on the A1081 Harpenden Road to the south of the site access. Much of the package of actionable mitigation is targeted at new or enhanced infrastructure for non-motorised users to enhance network connectivity, deliver dedicate infrastructure where this is currently not provided which in turn address perceptions of fear and intimidation. Specifically, on the A1081 Harpenden Road to the south of the site access, it is considered that these enhancements would offer a significant benefit to both existing and future residents providing a continuous network of dedicated cycle infrastructure segregated from vehicle traffic and pedestrians thereby removing many existing potential conflict points.

15.131 Taking account of the package of actionable mitigation, the sensitivity of receptors across the study links is medium (taken as the most sensitive receptor on the links being assessed). The magnitude of change is considered to be low. Therefore, there is likely to be a direct, permanent, long-term, minor adverse effect.

Road user and pedestrian safety

15.132 The package of actionable mitigation measures comprises extensive improvements to pedestrian and cycle infrastructure, the implementation of modal filters and traffic calming across the local highway network surrounding the application site. Collectively this package of measures offers a greater degree of user segregation than is present currently which ought to also offer a highway safety benefit.

15.133 Taking account of the package of actionable mitigation, the sensitivity of receptors across the study links is medium (taken as the most sensitive receptor on the links being assessed). the magnitude of change is considered to be low. therefore, there is likely to be a direct, permanent, long-term, **minor adverse**.

CONCLUSION

15.134 As a result of the transport strategy and proposed infrastructure improvements, the development will not result in any significant residual adverse effects on the local highway network or within the local area.

15.135 Table 133 summarises significance of residual effects on sensitive receptors following the implementation of the package of actionable mitigation proposed.

Table 133: Significance of residual effects on transport sensitive receptors

ENVIRONMENTAL RECEPTOR/RESOURCE	SIGNIFICANCE OF RESIDUAL EFFECT
People at home on A1081 Harpenden Road south of the site access	Minor adverse
Pupils of St Albans Girls' School	Minor adverse
Pupils of Garden Fields JMI School	Negligible adverse
Pupils of Batchwood School	Negligible adverse
Bernard's Heath	Negligible adverse
Dorent House	Minor adverse
Users of the PRoW footpath in the southeast of the site	Negligible adverse
National Cycle Network Route 6	Minor adverse
Ancient Briton Signalised junction	Minor adverse
King William IV Signalised junction	Negligible adverse
Beech Bottom Dyke	Negligible adverse

16 Noise and vibration

16.1 This chapter of the ES concerns the likely significant environmental effects of the proposed development in terms of Noise and Vibration. It has been compiled by Noise Consultants Limited ("NCL"), part of Logika Group.

16.2 The proposed development could affect human noise sensitive receptors during the construction phase as a result of temporary, short- to medium-term construction noise and vibration impacts, and during the operational phase as a result of long-term changes to road traffic noise, the relocated playing fields and building services noise. Mitigation measures are identified, where appropriate, to avoid, reduce or offset any significant adverse effects identified, and/or enhance likely beneficial effects.

16.3 Additionally, the prevailing noise environment along with vibration from the railway line has informed the outline noise and vibration mitigation strategy for the proposed noise and vibration sensitive development.

16.4 The chapter is supported by the following technical appendices:

Appendix 16.1: Glossary
Appendix 16.2: Legislation, Policy and Guidance
Appendix 16.3: Baseline Noise and Vibration Survey
Appendix 16.4: Construction Noise and Vibration Assessment
Appendix 16.5: Operational Noise Assessment
Appendix 16.6: Site Suitability Assessment

ASSESSMENT METHODOLOGY

Study area

16.5 To assess the effects of construction noise and vibration, the spatial extents of the study area are:

(1) 300m from the site boundary for construction noise assessment; and

(2) 100m from the site boundary for construction vibration assessment.

16.6 To assess the effects of operational sound from building services and sports activities, the spatial extent of the study area is 100m from the site boundary.

16.7 Spatial study areas relative to the site boundary are shown in Figure 16.1.

16.8 For operational road traffic noise, the study area incorporates the key major road links, defined in conjunction with the project transport consultant. Specific receptors are identified within 50m of an assessed road which is likely to experience a 1 dB(A) short-term change in road traffic noise level as a result of the proposed development traffic.

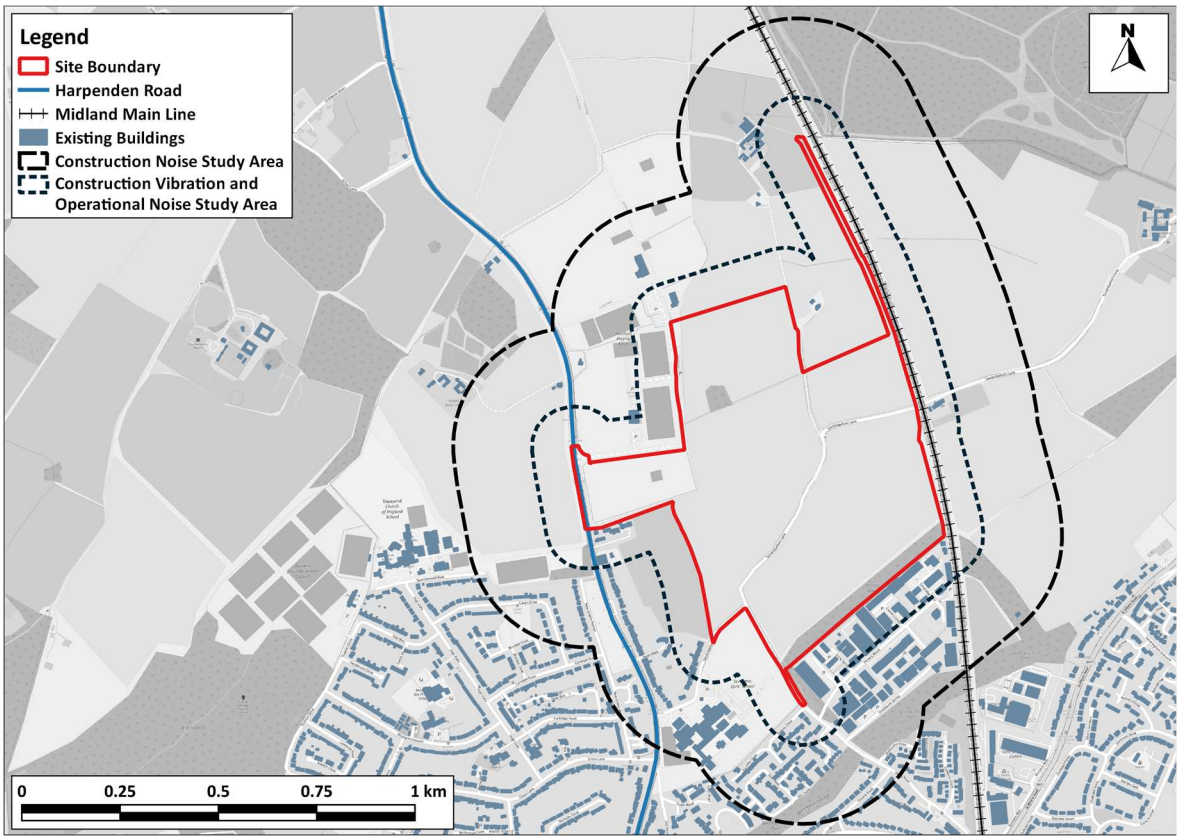

Figure 16.1: Noise and Vibration Study Areas

Consultation

16.9 The noise and vibration assessments have been carried out with regard to the methodologies set out in the Scoping Report at Appendix 1.1.

Legislative / planning policy context

16.10 Relevant legislation, policy and guidance to the assessment of noise and are listed below and described in detail in Appendix 16.2.

(1) Control of Pollution Act 1974[57]

(2) Environmental Protection Act 1990[58]

(3) National Planning Policy Framework (NPPF, 2023)[59]

(4) Planning Practice Guidance – Noise (PPG-N, 2019)[60]

(5) Noise Policy Statement for England (NPSE, 2010)[61]

(6) The District Local Plan Review 1994 – Saved and Deleted Policies, St Albans City and District Council (2020)[62]

[57] Control of Pollution Act, 1974. UK Government.

[58] Environmental Protection Act, 1990. UK Government.

[59] National Planning Policy Framework, (2023), Ministry for Housing, Communities and Local Government and Department for Levelling Up, Housing and Communities.

[60] Noise, (2019), Department for Levelling Up, Housing and Communities and Ministry of Housing, Communities Local Government (2018 to 2021)

[61] Noise Policy Statement for England, (2010), Department for Environment, Food & Rural Affairs

[62] The District Local Plan Review 1994 – Saved and Deleted Policies Version, (2020), St Albans City & District Council

(7) Draft Plan 2041 (Regulation 18 Public Consultation), St Albans City and District Council (2023)[63]

(8) Guidelines for Environmental Noise Impact Assessment, Institute of Environmental Management and Assessment (IEMA, 2014)[64]

(9) BS 5228-1: 2009+A1: 2014 Code of practice for noise and vibration control on construction and open sites: Part 1 – Noise (2014)[65]

(10) BS 5228-2: 2009+A1: 2014 Code of practice for noise and vibration control on construction and open sites: Part 2 – Vibration (2014)[66]

(11) BS 4142: 2014+A1: 2019 Methods for rating and assessing industrial and commercial sound (2019)[67]

(12) Acoustic Design of Schools: Performance Standards - Building Bulletin 93 (BB93, 2015)[68]

(13) Acoustics of Schools: A Design Guide (AoS, 2015)[69]

(14) Sport England Design Guidance Note: Artificial Grass Pitch (AGP) Acoustics – Planning Implications (2015)[70]

(15) Guidelines for Community Noise, World Health Organization (WHO, 1999)[71]

(16) Night Noise Guidelines for Europe, WHO (2009)[72]

(17) Calculation of Road Traffic Noise (CRTN), Department of Transport Welsh Office (1988)[73]

(18) Design Manual for Roads and Bridges (DMRB), LA 111 Noise and Vibration (2020)[74]

(19) BS 8233: 2014 Guidance on sound insulation and noise reduction for buildings (2014)[75]

(20) Professional Practice Guidance on Planning & Noise: New Residential Development (ProPG), Association of Noise Consultants (ANC), Institute of Acoustics (IoA), and Chartered Institute of Environmental Health (CIEH) (2017)[76]

(21) Building Regulations Approved Document O – Overheating (2022)[77]

(22) Procedure for the Assessment of Low Frequency Noise Complaints (NANR45)[78]

(23) Institute of Acoustics Good Practice Guide on the Control of Noise from Pubs and Clubs (IOA GPG) (2003)[79] including Noise Act Research[80]

(24) BS 6472-1: 2008 Guide to evaluation of human exposure to vibration in buildings. Part 1: Vibration sources other than blasting (2008)[81].

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[63] Draft Local Plan 2041 – Regulation 18 Public Consultation, (2023), St Albans City & District Council

[64] Guidelines for Environmental Noise Impact Assessment, (2014), Institute of Environmental Noise Management and Assessment

[65] BS 5228-1: 2009+A1: 2014 Code of practice for noise and vibration control on construction and open sites: Part 1 – Noise, (2014), British Standards Institute

[66] BS 5228-2: 2009+A1: 2014 Code of practice for noise and vibration control on construction and open sites: Part 2 – Vibration, (2014), British Standards Institute

[67] BS 4142:2014+A1: 2019 Methods for rating and assessing industrial and commercial sound, (2019), British Standards Institute

[68] Acoustic Design of Schools: Performance Standards - Building Bulletin 93, (2015), Department for Education

[69] Acoustics of Schools: A Design Guide, (2015), Institute of Acoustics and Association of Noise Consultants

[70] Sport England Design Guidance Note: Artificial Grass Pitch (AGP) Acoustics – Planning Implications, (2015), Sport England

[71] Guidelines for Community Noise, (1999), World Health Organization

[72] Night Noise Guidelines for Europe, (2009), World Health Organization

[73] Calculation of Road Traffic Noise, (1988), Department of Transport, Welsh Office

[74] Design Manual for Roads and Bridges LA111 Noise and Vibration, (2020), Standards for Highways

[75] BS 8233: 2014 Guidance on sound insulation and noise reduction for buildings, (2014), British Standards Institute

[76] Professional Practice Guidance on Planning & Noise: New Residential Development, (2017), Association of Noise Consultants, Institute of Acoustics, and Chartered Institute of Environmental Health

[77] Overheating: Approved Document O, (2021), Ministry of Housing, Communities and Local Government and Department for Levelling Up, Housing and Communities

[78] Procedure for the assessment of low frequency noise complaints (Defra contract NANR45), (2011) University of Salford

[79] Good Practice Guide on the Control of Noise from Pubs and Clubs, (2003), Institute of Acoustics

[80] NANR163 – Noise from Pubs and Clubs Phase II (2006), Capita Symonds and BRE on behalf of Defra

[81] BS 6472-1: 2008 Guide to evaluation of human exposure to vibration in buildings. Part 1: Vibration sources other than blasting, (2008), British Standards Institute

Assessment of process

16.11 The identification of likely significant effects requires consideration of the following:

(1) Significant adverse effects on health and quality of life, as identified through Government noise policy set out by the NPS

(2) Environmental likely significant effects (adverse and beneficial) required by the EIA regulations

(3) In combination effects (intra-project effect

(4) Cumulative noise effects (inter-project effects).

16.12 Government policy ("NPSE") and guidance ("PPG-N") establish effect levels relating to the likelihood of significant adverse effects on health and quality of life. Notably:

(1) LOAEL – Lowest Observed Adverse Effect Level

(2) SOAEL – Significant Observed Adverse Effect Level

(3) UAEL – Unacceptable Adverse Effect Level

16.13 The NPSE states that a 'single objective' noise (or vibration) based measure applicable to all sources and receptors that defines the onset of LOAEL and SOAEL is not possible. However, thresholds can be defined based upon relevant policy, available standards and technical guidance.

16.14 Likely significant effects on health and quality of life are considered to have occurred should noise exposure from the proposed development result in a noise-sensitive receptor newly exceeding the SOAEL, taking into account any mitigation or compensation measures that are part of the proposed development.

16.15 A significant effect is not deemed to occur where noise exposure from the proposed development is below LOAEL.

16.16 Where noise exposure from the proposed development falls between LOAEL and SOAEL, Government policy requires that the proposed development should include measures, where it is sustainable to do so, to 'mitigate and minimise' adverse effects.

16.17 In EIA terms, determining whether a significant adverse effect occurs where noise exposure lies between the LOAEL and SOAEL thresholds requires consideration of quantitative and qualitative factors, including:

(1) Noise exposure

(2) Change in noise level

(3) Type and magnitude of impact

(4) Existing ambient acoustic environment

(5) Additional metrics (such as L_{Amax})

(6) How effective the measures employed to mitigate the effect are likely to be, based on professional judgement (including best practicable means (BPM)

(7) The duration of the effect.

16.18 The sensitivity of receptors is summarised in Table 134.

Table 134: Sensitivity of noise related receptors

SENSITIVITY	DESCRIPTION
High	People, primarily where they live ('residential receptors') in terms of individual dwellings, including any shared community open areas (e.g. parks) as well as private open spaces (e.g. gardens)[82]
Medium	Non-residential community facilities including educational, healthcare, places of worship, hotels. Collectively described as 'non-residential receptors'. Designated 'quiet areas'[83].
Low	All other receptors including industrial uses, offices and retail.

16.19 The assessment of noise effects primarily focuses on high sensitivity, residential receptors for which most adverse effect levels have been derived. Medium sensitivity non-residential receptors have also been considered as a 'sensitivity test' where these receptors could be directly affected by the proposed development.

16.20 Table 135 sets out the magnitude of impact descriptors typically used in the noise assessments. The descriptors relate to both a change in noise exposure and a magnitude of change in noise exposure.

Table 135: Magnitude of Impact Descriptors for noise sensitive receptors

IMPACT	MAGNITUDE OF NOISE EXPOSURE	MAGNITUDE OF CHANGE IN NOISE EXPOSURE
None	Used to describe a noise exposure equal to or below LOAEL	Used to describe a magnitude of change in noise exposure which is imperceptible.
Low	Used to describe a noise exposure greater than LOAEL and equal to or below SOAEL	Used to describe a magnitude of change in noise exposure which has the potential to indicate a significant effect.
Medium	Used to describe a noise exposure greater than SOAEL and equal to or below UAEL (if applicable)	Used to describe a magnitude of change in noise exposure which indicates a significant effect.
High	Used to describe a noise exposure greater than UAEL (if applicable)	

16.21 In general terms, negligible and low impacts indicate that an effect is likely to be not significant and represent negligible and minor effects. Medium and high impacts indicate that an effect is likely to be significant and represent moderate and major effects.

16.22 The final assessment of significance for a specific source of noise is a combination of receptor sensitivity, magnitude of impact (either in terms of noise exposure or change in noise exposure, or a combination of the two), and consideration of context based on the remaining factors described in paragraph 16.17.

[82] 'Shared community open areas' are those that the national planning practice guidance identifies may partially offset a noise effect experienced by residents at their dwellings and are either a) relatively quiet nearby external amenity spaces for sole use by a limited group of residents as part of the amenity of their dwellings, or b) a relatively quiet, external publicly accessible amenity space (for example a park or local green space) that is nearby.

[83] 'Quiet areas' comprise areas designated under Local Plans or Neighbourhood Development Plans as Local Green Spaces and areas identified as Quiet Areas through the implementation of the Environmental Noise (England) Regulations 2006.

Assessment criteria – construction noise

16.23 The assessment of noise effects associated with the construction activities of the proposed development has regard to the methodologies set out in BS 5228-1. Construction noise effects from on-site works have been determined through the use of noise modelling to predict noise at the noise sensitive receptors ("NSRs"). The detailed construction noise assessment methodology is set out in Appendix 14.4: Construction Noise and Vibration Assessment.

16.24 Adverse effect levels with respect to Government noise policy are set out in Table 136 as outdoor, free-field noise levels.

Table 136: Construction noise adverse effects levels

PERIOD	LOAEL	SOAEL	UAEL
Daytime (07:00 to 19:00)	65 dB $L_{Aeq,12hr}$	75 dB $L_{Aeq,12hr}$	85 dB $L_{Aeq,12hr}$
Evening (19:00 to 23:00)	55 dB $L_{Aeq,4hr}$	65 dB $L_{Aeq,4hr}$	75 dB $L_{Aeq,4hr}$
Night-time (23:00 to 07:00)	45 dB $L_{Aeq,8hr}$	55 dB $L_{Aeq,8hr}$	65 dB $L_{Aeq,8hr}$

16.25 Construction noise likely significant effects in EIA terms are compared against the magnitude of noise exposure scale in Table 138. Additional context includes the sensitivity of the receptor and receptor type, the duration of the activity and how effective noise mitigation such as BPM are likely to be in reducing the effect.

16.26 Based on the level of detail available at this stage of the project, the assessment of construction noise has considered a very worst-case whereby the single highest construction plant noise level occurs at the site boundary with shortest distance to the NSR, as well as a typical case which has regard to the spatial variation of construction activities across the site throughout the 10-year construction phase.

Assessment criteria – construction vibration

16.27 The assessment of vibration effects associated with the construction activities of the proposed development has regard to the methodologies set out in BS 5228-2. Construction vibration effects from on-site works have been determined through a qualitative assessment to predict the likelihood of a potentially significant effect occurring. The assessment of construction vibration has focused on a worst-case scenario which is expected to occur during the road works to create the new site access and site roads requiring the use of vibratory compaction.

16.28 Adverse effect levels with respect to Government noise policy are set out in Table 137 in terms of Peak Particle Velocity (PPV, mm/s).

Table 137: Construction vibration adverse effect levels

PERIOD	LOAEL	SOAEL	UAEL
Daytime, evening and night-time	0.3 mm/s PPV	1.0 mm/s PPV	10.0 mm/s

16.29 Construction vibration likely significant effects in EIA terms are compared against the magnitude of noise exposure scale in Table 138. Additional context includes the sensitivity of the receptor and receptor type, the duration of the activity and how effective noise mitigation such as BPM are likely to be in reducing the effect.

Assessment criteria – operational building services noise

16.30 The operational building services noise assessment applies to building services plant associated with proposed commercial uses (i.e. shops and cafes) as well as residential uses (i.e. air source heat pumps).

The assessment methodology has regard to BS 4142:2019 and is set out in detail in Appendix 14.5: Operational Noise Assessment.

16.31 Adverse effect levels with respect to Government noise policy are set out in Table 138. For residential receptors, the adverse effect levels are based on a comparison of the rated noise level ($L_{Ar,Tr}$ the combined noise exposure from all building services plant plus a correction for acoustic characteristics) against prevailing background sound level ($L_{A90,T}$). For non-residential receptors, the adverse effect levels are based on screening criteria.

Table 138: Operational building services noise adverse effect levels

PERIOD	RECEPTOR	LOAEL	SOAEL
Daytime and night-time	Existing Residential Receptors (off-site)	$L_{Ar,Tr}$ = Equal to background sound level, $L_{A90,T}$ (with consideration of context)	$L_{Ar,Tr}$ = Background sound level, $L_{A90,T}$, plus 10 dB (with consideration of context)
Daytime and night-time	Proposed Residential Receptors (on-site)		
Daytime	Existing Educational Receptor (off-site) at the nearest outdoor teaching area	50 dB $L_{Aeq,T}$	Predicted noise level, $L_{Aeq,T}$ exceeds LOAEL and increases prevailing noise level by 3 dB(A) or more
Daytime	Proposed Educational Receptor (on-site) at development parcel boundary		

16.32 Operational building services noise likely significant effects in EIA terms are compared against the magnitude of noise exposure scale in Table 138. Additional context is based on the guidance in BS 4142:2019 and includes consideration of factors such as absolute noise exposure from building services plant, prevailing ambient noise levels, and likely operating conditions/on-times.

Assessment criteria – operational sports activity noise

16.33 The operational sports activity noise assessment applies to the new playing fields which will be located in the north of the site. The assessment methodology has regard to Sport England's AGP guidance and World Health Organisation ("WHO") guidance and is set out in detail in Appendix 16.5: Operational Noise Assessment.

16.34 Adverse effect levels with respect to Government noise policy are set out in Table 139 as daytime outdoor free-field noise levels. It is assumed that the playing fields will not be operational during the night-time period (23:00 to 07:00).

Table 139: Operational sports activity noise adverse effect levels

PERIOD	LOAEL	SOAEL	UAEL
Daytime (07:00 to 23:00)	50 dB $L_{Aeq,1hr}$	55 dB $L_{Aeq,1hr}$	60 dB $L_{Aeq,1hr}$

16.35 Operational sports activity noise likely significant effects in EIA terms are compared against the magnitude of noise exposure scale in Table 138 Additional context includes factors such as the frequency of activities, duration of activities, and existing ambient noise environment.

Assessment criteria – operational off-site road traffic noise

16.36 The assessment of operational road traffic noise applies to the effects of additional road traffic generated by the proposed development on the local road network. The assessment methodology

has regard to CRTN and DMRB LA111 and is set out in detail in Appendix 16.5: Operational Noise Assessment.

16.37 Adverse effect levels with respect to Government noise policy are set out in Table 140.

Table 140: Operations off-site road traffic noise adverse effect level

PERIOD	LOAEL	SOAEL	UAEL
Daytime (06:00 to 24:00)	55 dB $L_{A10,18hr}$ (façade)	68 dB $L_{A10,18hr}$ (façade)	76 dB $L_{A10,18hr}$ (façade)
Night-time (23:00 to 07:00	40 dB $L_{night,outside}$ (free-field)	55 dB $L_{night,outside}$ (free-field)	66 dB $L_{night,outside}$ (free-field)

16.38 Table 141 sets out the magnitude of impact scale based on a change in noise exposure in the short-term (i.e. future year) and long-term (i.e. future year compared with opening or baseline year).

Table 141: Change in Road Traffic Noise level categories

MAGNITUDE OF CHANGE	SHORT-TERM CHANGE IN ROAD TRAFFIC NOISE LEVEL ($L_{A10,18HR}$)	LONG-TERM CHANGE IN ROAD TRAFFIC NOISE LEVEL ($L_{A10,18HR}$)
None	<1.0 dB	<3.0 dB
Low	1.0 to 2.9 dB	3.0 to 4.9 dB
Medium	3.0 to 4.9 dB	5.0 to 9.9 dB
High	≥5.0 dB	≥10.0 dB

16.39 The assessment of off-site road traffic noise effects commences with an assessment of the short-term change in road traffic basic noise level (BNL) as calculated using the CRTN methodology. A short-term change in BNL of less than 1 dB(A) represents negligible impact and a significant effect in terms of the EIA Regulations is not deemed to occur.

16.40 Where the magnitude of change in the short-term is low, medium or high, specific NSRs are identified within 50m of the road link and the BNLs are corrected for distance to the worst-affected façades. If a low, medium or high magnitude of impact is still indicated at the NSRs, the additional factors set out in Table 142 are considered, where applicable, in order to conclude the effect significance.

Table 142: Additional factors for off-site road traffic noise assessment

CIRCUMSTANCE	INFLUENCE ON SIGNIFICANCE
Noise level change	If the noise level change is within 1 dB of the top of the minor range, it can indicate that it is more appropriate to determine a likely significant effect.
	If the noise level change is within 1 dB of the bottom of a moderate range, it can indicate that it is more appropriate to consider that the change is not a likely significant effect.
Different magnitude of impact in the long-term to the short-term	Where the long-term impact is predicted to be greater than the short-term impact, it can be appropriate to conclude that a minor change in the short-term is a significant effect.
	Where the long-term impact is predicted to be less than the short-term impact, it can be appropriate to conclude that a moderate or major change in the short-term is not significant.
Absolute noise level with reference to LOAEL and SOAEL	A noise change where all "Future Baseline With Development" absolute noise levels are below the SOAEL requires no modification of the initial assessment.

CIRCUMSTANCE	INFLUENCE ON SIGNIFICANCE
	Where any "Future Baseline With Development" absolute noise levels are above the SOAEL, a noise change in the short-term of +1.0 dB or more results in a likely significant effect.
Acoustic context	If the project changes the acoustic character of an area, it can be appropriate to conclude a minor magnitude of change in the short-term and/or long-term is a likely significant effect.
Likely perception of change by residents	If the project results in obvious changes to the landscape or setting of a receptor, it is likely that noise level changes will be more acutely perceived by the NSRs. In these cases, it can be more appropriate to conclude that a minor change in the short-term and/or long-term is a likely significant effect.
	If the project results in no obvious changes for the landscape, particularly if the road is not visible from the NSR, it can be more appropriate to conclude that a moderate change in the short-term and/or long-term is not a likely significant effect.

Assessment criteria – site suitability assessment

16.41 As the proposed residential, education and commercial uses are not existing, the assessment of the suitability of the site for noise-sensitive development is only carried out with reference to Government noise policy and relevant target noise and vibration fixed criteria, not changes in noise exposure or EIA significance criteria. The site suitability criteria, assumptions and assessment are provided in Appendix 16.6: Site Suitability Assessment. The assessment has been carried out with regard to the parameter plans.

16.42 The assessment of the suitability of the site for residential development is carried out with regard to the target internal and external noise criteria set out in ProPG and BS 8233. The assessment of industrial noise sources has been conducted having regard to the methodologies set out in BS 4142 and relevant contextual guidance. A high level assessment of amplified music noise has been carried out with regard to the IOA GPG. In respect of vibration from the railway line, measured vibration levels are reviewed against the 'low probability of adverse comment' range described in BS 6472.

16.43 A high-level assessment on the likely impact of noise on the proposed school site is provided based on typical noise limits set out in BB93 and AoS.

16.44 Outline noise and vibration mitigation measures are established, appropriate to the level of detail currently available and for further refinement as the detailed development is progressed.

Sources of information

16.45 Construction noise and vibration assessment assumptions have been based on the indicative assumptions set out in Chapter 3 of this ES. Construction plant noise levels have been derived from BS 5228-1 Annex C. The construction vibration assessment is based on empirical equations set out in BS 5228-2 Annex E for a typical item of vibratory plant.

16.46 Specific items of building services plant and equipment will not be known in detail until much later in the design programme. Therefore, the assessment is based on setting Environmental Sound Criteria based on the LOAELs.

16.47 The assessment of operational sports activity includes noise modelling of the proposed layout of the playing fields using the methodology set out in the Sport England AGP guidance. The layout of the playing fields has been determined from Define drawing DE_565_081 Rev C.

16.48 Road traffic data has been provided by the Transport Consultants for the purposes of the operational off-site road traffic noise assessment. The road traffic data has been provided in 18-hour Average Annual Weekday Traffic (AAWT for the period 06:00 to 24:00) including percentage of heavy goods vehicles (HGV) and average or posted speeds. The road traffic data includes the contribution of

relevant cumulative schemes in the area. The relevant traffic data is provided in Appendix 16.5: Operational Noise Assessment.

16.49 The parameter plans have informed the site suitability assessment, in particular the Land Use parameter plan which sets out the arrangement of the proposed land uses.

Assumptions

16.50 The baseline noise and vibration measurement survey carried out in May 2024 to inform the assessment of noise and vibration effects and suitability of the site for noise sensitive development is reflective of typical noise and vibration conditions on the site.

16.51 Detailed assumptions in relation to each of the assessments are set out within the respective appendices: Appendix 16.4: Construction Noise and Vibration Assessment; Appendix 16.5: Operational Noise Assessment; and Appendix 16.6: Site Suitability Assessment

Assessment limitations

16.52 The noise and vibration assessments are based on the information provided to NCL including indicative details on construction phasing and methodology, the proposed development parameter plans and sports pitch layout, and road traffic data.

16.53 From this information, a number of assumptions have been derived based on experience of similar schemes and the baseline noise and vibration conditions as set out in the relevant appendices.

BASELINE CONDITIONS

16.54 Baseline noise and vibration conditions have been determined through a baseline noise and vibration measurement survey which was carried out from Wednesday 15 May to Thursday 16 May 2024. The survey was designed to capture noise levels across the site during the daytime (07:00 to 23:00) and night-time (23:00 to 07:00) periods using monitoring locations which are representative of both existing NSRs and noise and vibration sources which are likely to impact the proposed development. Figure 16.2 presents the noise monitoring locations.

16.55 The noise measurement survey was carried out in general accordance with BS 7445-1. The vibration measurement study was carried out in general accordance with BS ISO 14837-1.

16.56 The dominant contributors to the existing baseline acoustic environment at the measurement locations included:

(1) Road traffic noise from Harpenden Road to the west of the site
(2) Railway noise and vibration from the Midland Main Line railway to the east of the site
(3) Industrial noise from the industrial estate to the south of the site

16.57 Noise from any sporting activities which occurred at the existing Woollam Playing Fields and St Albans Girls School during the noise survey period was not clearly observed during the survey[84].

16.58 Table 143 demonstrates the five noise monitoring locations which were left on site for a whole 24-hour period. Table 144 presents the baseline vibration levels measured at the vibration monitoring location ("VML"). The noise levels are rounded to the nearest decibel. Further detail on the baseline noise and vibration conditions can be found in Appendix 14.3.

[84] For the purposes of the site Suitabilty Assessment, noise from existing playing fields and sports pitches has been modelled in accordance with the Sports England AGP Guidance .

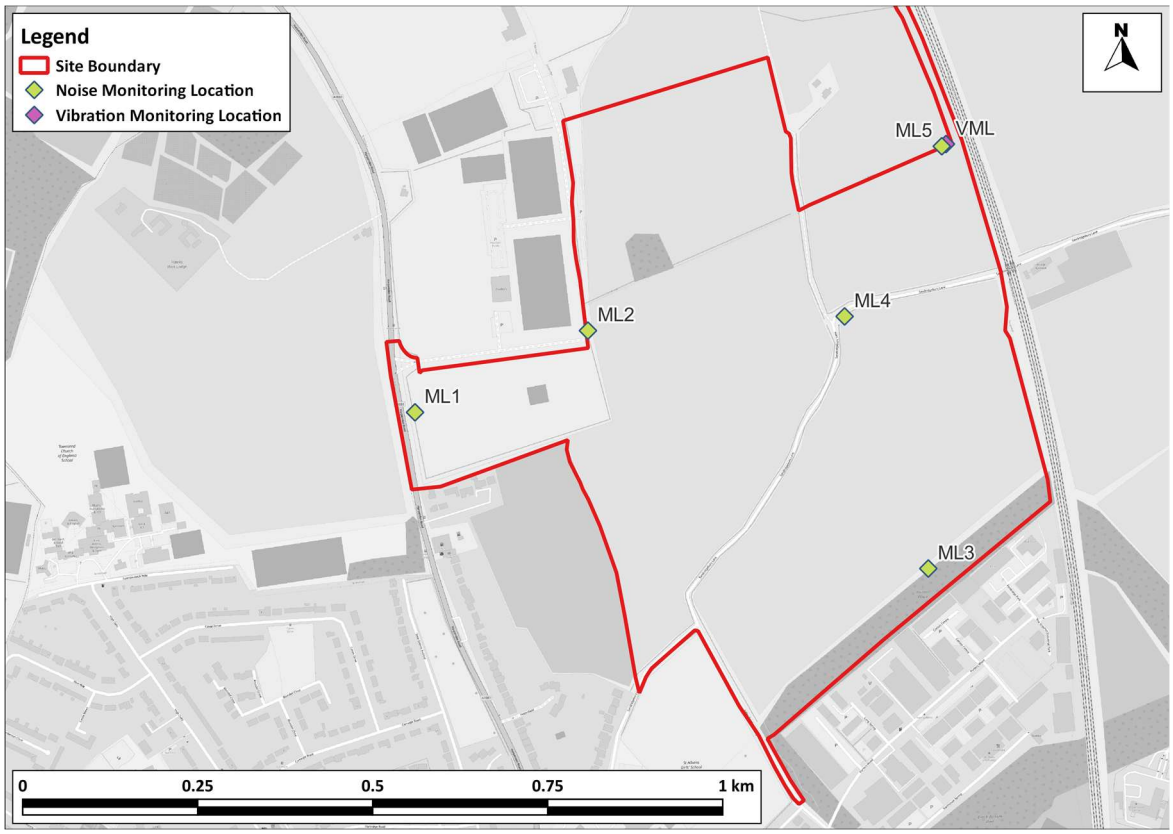

Figure 16.2: Baseline Noise and Vibration Monitoring Locations

Table 143: Measured Baseline Noise Levels

LOCATION	PERIOD	$L_{AEQ,T}$ (DB)	10TH HIGHEST L_{AFMAX} (DB)	TYPICAL BACKGROUND SOUND LEVEL $L_{A90,T}$ (DB)
ML1	Daytime	63	-	49
	Night-time	56	75	33
ML2	Daytime	48	-	38
	Night-time	43	56	30
ML3	Daytime	50	-	37
	Night-time	38	58	32
ML4	Daytime	52	-	34
	Night-time	45	62	30
ML5	Daytime	60	-	34
	Night-time	53	77	30

Table 144: Measured baseline vibration levels

PERIOD	VIBRATION DOSE VALUE ($MS^{-1.75}$)		
	X	Y	Z
Daytime	0.02	0.03	0.14
Night-time	0.01	0.01	0.06

16.59 A subsequent survey was carried out in respect of tonal substation noise at 100Hz. This survey, which is also described in Appendix 16.3, included 66 short-term attended measurements across parts of development parcel D1 with subjective observations of the noise generated by the substation transformers. The survey results were used to generate noise contours of the 100Hz noise levels to inform the site suitability assessment in Appendix 16.6.

16.60 Table 148 identifies the NSR groups and the corresponding sensitivity based on Table 137. It should be noted that not all NSR groups are considered in all assessments depending on where they are located in relation to the relevant study area. Table 145 shows the locations of the NSR groups.

Table 145: Noise Sensitive Receptor Groups and Sensitivity

NSR REFERENCE	ENVIRONMENTAL RECEPTOR/RESOURCE	SENSITIVITY
A	Residential receptor at Cheapside Farm	High
B	Residential receptors at Cheapside Farm	High
C	Residential receptors on Sandridgebury Lane	High
D	Residential receptors at Oak Court, The Birches, Porters Wood House, Sandridge Park	Medium
E	Residential receptors off St Albans Road	High
F	Residential receptors on Firbank Road, Valley Road, Melbourne Road	High
G	Residential receptors on Darwin Close, Farriday Close, Ellis Fields, Potters Field	High
H	Educational receptor St Albans Girls' School	Medium
I	Residential receptors on Sandridgebury Lane	High
J	Residential Receptors on Sewell Trust Land	High
K	Residential receptors on Harpenden Road and Petersfield	High
L	Residential receptors at New Greens Avenue and Cavan Drive	High
M	Residential receptors on Harpenden Road	High
N	Residential receptors on Harpenden Road	High
O	Education receptor introduced by the proposed development	Medium
P	Residential receptors introduced by the proposed development	High

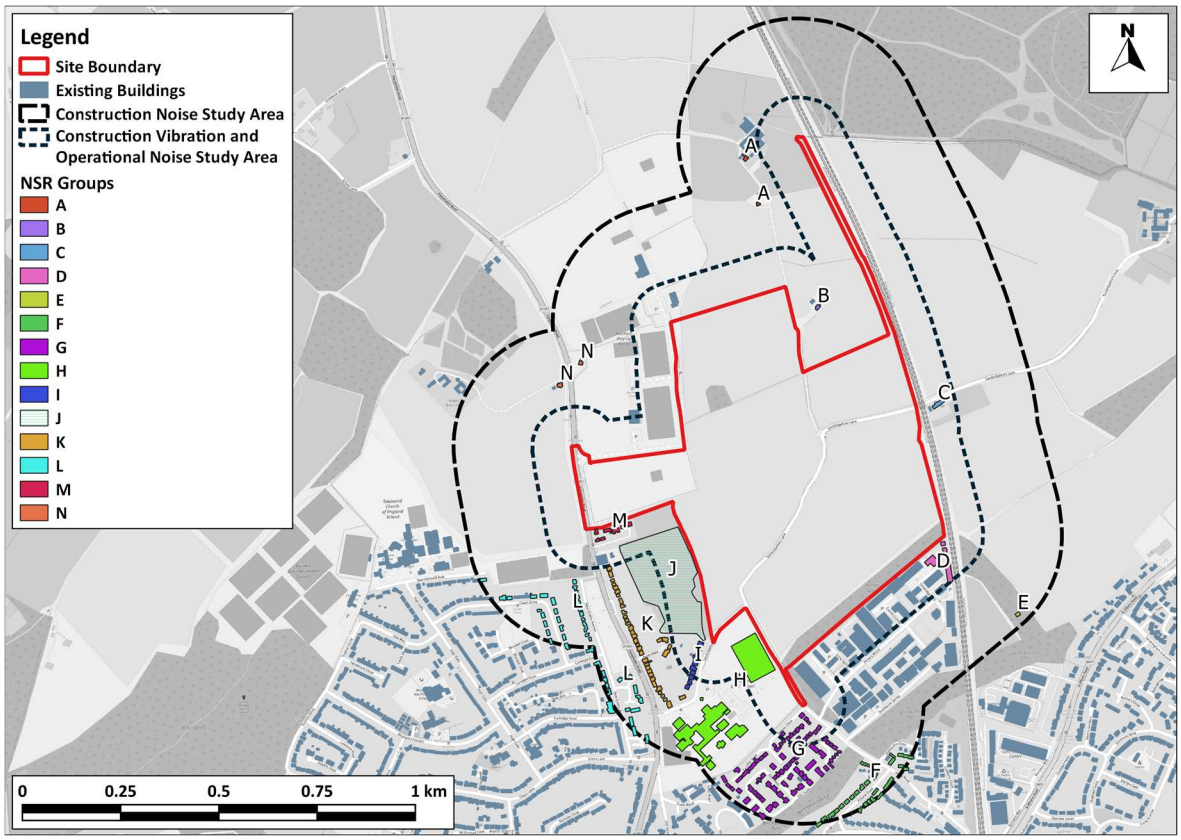

Figure 16.3: Noise Sensitive Receptor Groups

INHERENT AND STANDARD MITIGATION

16.61 Standard mitigation for construction noise and vibration will be provided through a commitment to implement a CEMP during the construction phase of the proposed development. Key 'best practicable means' ("BPM") principles which will be adhered to and developed during construction activities, where practicable, include:

(1) Substitution of construction plant with quieter or lower vibration options.

(2) Equipment siting away from NSRs.

(3) Screening NSRs from noisy activities through the use of site hoardings, site cabins, material stores, or other localised acoustic screens and enclosures.

(4) Working methods including reducing the number of concurrent noisy activities in localised areas, completing activities close to NSRs quickly and efficiently, shutting down noisy equipment when not in use, minimising startup/rundown of vibratory compactors close to NSRs.

(5) Adhering to hours to work agreed with SACDC[85], or otherwise seeking prior agreement for any work requirement outside of those hours with reasonable notice.

(6) Incorporating noise and vibration control into risk assessment and method statements at an early stage.

(7) Providing proactive links between noise management activities and community relations activities to keep local residents informed of periods of likely intensive construction activities,

[85] Environmental Services, Noise Nuisances, Construction Noise. Available at: https://www.stalbans.gov.uk/environmental-services (Accessed 9 August 2024)

including changes to hours of work, and appointing a site contact to whom complaints/queries about noise and vibration can be directed, investigated and acted upon.

16.62 Where practicable to do so, the above standard construction noise and vibration mitigation is considered with the relevant assessment.

16.63 Inherent mitigation applicable to noise and vibration includes setting back noise and vibration sensitive development areas from the major transportation and industrial noise sources. The set backs are secured through the parameter plans.

ASSESSMENT OF ENVIRONMENTAL EFFECTS

Construction phase

16.64 The assumptions which underpin the construction noise and vibration assessments are presented in Appendix 16.4. This sections out a summary of the assessment outcomes.

16.65 The construction noise assessment has considered an assumed plant list for four construction activities, minimum and average distances from the nearest worksites to the nearest NSR in each group, and worst-case and typical construction activity noise levels. The construction activities considered include earthworks, roadworks, general construction, and fitout and landscaping.

16.66 The worst-case assessment considers the plant item with the single highest noise level from each activity group occurring at the closest distance to the nearest NSR in each group. A distance correction, derived from the BS 5228-1 methodology, has been used to calculate the construction noise level at the receptor location.

16.67 The following likely effects have been identified:

(1) Medium impacts are likely at NSR group J during earthworks and general construction activities.

(2) Low impacts are likely during earthworks at NSR groups C, G, H, I and M.

(3) Low impacts are likely during roadworks at NSR group I.

(4) Low impacts are likely during general construction at NSR groups C, G, H, I and M.

(5) Low impacts are likely during fit out and landscaping at NSR groups G, I, J and M.

16.68 For all other receptor groups and construction activity combinations, the impact is negligible.

16.69 In the context of the worst-case assessment, these impacts will be adverse, short-term and temporary. Low impacts equate to a noise exposure between LOAEL and SOAEL. In EIA terms this a minor adverse effect and is Not Significant. In line with Government policy, the effect should be mitigated and minimised as far as practicable.

16.70 A medium impact equates to a noise exposure between SOAEL and UAEL, and in line with Government policy, should be avoided. A medium impact is identified in the worst-case assessment for one receptor: group F. This is a committed development which may be built-out on a similar timescale to the adjacent development parcel or may be fully occupied. In practice, the noisiest plant is only likely to operate at such close distances to any single receptor within group F for a relatively short duration of time (i.e., a few days). BPM mitigation that is likely to be applied include site hoardings and predicted noise levels may therefore be up to 5 dB quieter and would be further reduced if a quieter item of plant is selected. The application of such noise mitigation is likely to reduce the worst-case noise level to below SOAEL. In terms of the worst-case assessment, this is a minor adverse effect and is not significant.

16.71 To provide further context to the assessment of construction noise, a typical assessment has also been carried out. The typical assessment considered the total noise level for each construction activity and the average distance between the nearest NSR and closest development parcel in order to represent

a spatial average of noise levels over a short to medium-term period of the construction phase. The following likely effects have been identified:

(1) Low impacts at NSR Groups J and M during general construction activities.

16.72 For all other receptor group and construction activity combinations, the impact is negligible.

16.73 In conclusion, construction noise effects are, at most, short to medium-term in duration, temporary, minor adverse and not significant.

16.74 With respect to introduced receptors O and P (see Table 148), it is expected that roadworks will be completed sufficiently in advance of proposed dwellings becoming occupied such that any impacts would not occur or otherwise be negligible. Construction noise resulting from activities such as earthworks and general construction within approximately 40m of the NSR are likely to exceed LOAEL and within approximately 15m of the NSR are likely to exceed SOAEL. Typical phasing patterns of housing developments are likely to avoid occupied receptors being exposed to noise levels exceeding SOAEL. However, there are likely to be short-term periods where construction activities exceed LOAEL.

16.75 The construction vibration assessment assumes vibratory compaction during the roadworks required to create the new site access as this is anticipated to result in the worst-case effects. The calculated vibration levels have been derived from empirical equations provided in BS 5228-2. In summary, vibration levels during steady state compaction are likely to exceed LOAEL at a distance of approximately 83m from the source, exceed SOAEL at approximately 36m from the source, and exceed UAEL at approximately 6m from the source. However, it should be noted that vibration propagation is strongly affected by the ground conditions and this assessment is considered to represent a worst-case.

16.76 The vibration assessment identifies a low impact at NSR group M. For all other receptors groups, the impact is negligible.

16.77 Construction vibration effects are, at most, short-term in duration, temporary, minor adverse and Not Significant.

16.78 Table 146 summarises the conclusions of the construction noise assessment and Table 147 summarises the conclusions of the construction vibration assessment.

Table 146: Significance of Construction Noise Effects

ENVIRONMENTAL RECEPTOR/RESOURCE	SENSITIVITY	MAGNITUDE OF EFFECT	SIGNIFICANCE OF EFFECT
A, B, D, E, F, K, L, N	High	Negligible	Negligible Not significant
C, G, I, J, M, P	High	Low	Minor adverse Not significant
H, O	Medium	Low	Minor adverse Not significant

Table 147: Significance of construction vibration effects

ENVIRONMENTAL RECEPTOR/RESOURCE	SENSITIVITY	MAGNITUDE OF EFFECT	SIGNIFICANCE OF EFFECT
A, B, C, D, E, F, G, I, J, K, L, N, P	High	Negligible	Negligible Not significant
M	High	Low	Minor adverse Not significant
H, O	Medium	Negligible	Negligible Not significant

Operational phase

16.79 The assumptions which underpin the operational noise assessments are presented in Appendix 16.5. This sections out a summary of the assessment outcomes.

16.80 In respect of building services noise, details of fixed plant installation are not currently available, therefore the assessment establishes ESCs with reference to the LOAELs set out in Table 136 for the relevant receptor types. The ESCs can be secured by a suitably worded planning condition and addressed at an appropriate stage when building services requirements are progressed. Provided that the ESCs are achieved, subject to consideration of context, the effect of building services noise on all NSRs will be long-term, permanent, and negligible. Table 148 summarises the ESCs for all relevant receptor groups in the operational noise study area.

Table 148: Environmental Sound Criteria for Building Services Noise

RECEPTOR GROUP	DAYTIME RATING LEVEL $L_{AR,TR}$ (DB)	NIGHT-TIME RATING LEVEL $L_{AR,TR}$ (DB)
B	34	30
C	34	30
D	37	32
G	37	32
H	50	N/A
I	38	30
J	38	30
M	38	30
O	50	N/A
P	32	22

16.81 With reference to Figure 16.4 sports activity noise from the proposed playing fields is below 50 dB $L_{Aeq,1hr}$ at all receptor groups. This is below LOAEL and therefore a long-term, permanent and negligible effect.

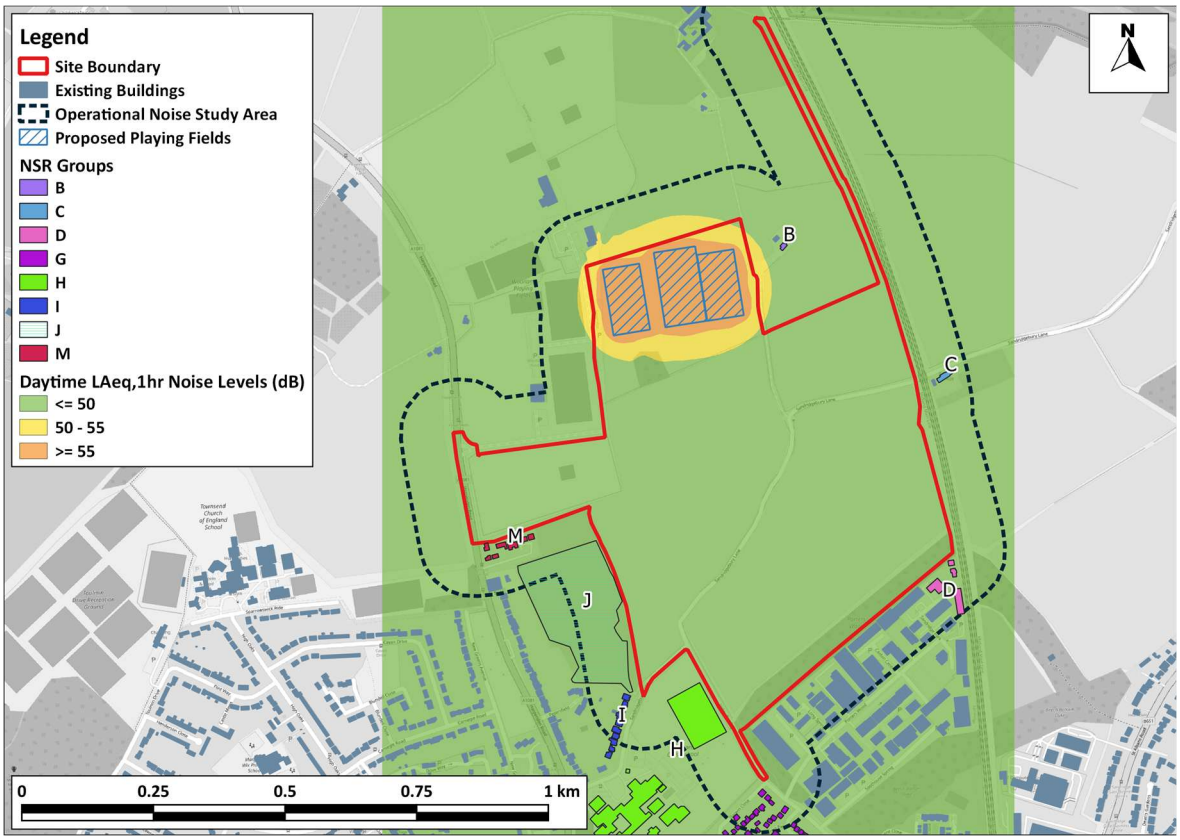

Figure 16.4: Sports Activity Noise from Proposed Playing Fields

16.82 The short-term assessment of off-site road traffic noise identifies that the change in road traffic noise (2028 opening year with development minus 2028 opening year without development) is less than 1 dB(A) on all the assessment road links. Therefore, it is concluded that the proposed development will have a long-term, permanent and negligible effect on road traffic noise.

16.83 The following tables summarise the significance of effects based on the above operational phase assessments.

Table 149: Significance of Building Services Noise

ENVIRONMENTAL RECEPTOR/RESOURCE	SENSITIVITY	MAGNITUDE OF EFFECT	SIGNIFICANCE OF EFFECT
A, B, C, D, E, F, G, I, J, K, L, M, N, P	High	Negligible	Negligible Not Significant
H, O	Medium	Negligible	Negligible Not Significant

Table 150: Significance of Sports Activity Noise

ENVIRONMENTAL RECEPTOR/RESOURCE	SENSITIVITY	MAGNITUDE OF EFFECT	SIGNIFICANCE OF EFFECT
A, B, C, D, E, F, G, I, J, K, L, M, N, P	High	Negligible	Negligible Not Significant
H, O	Medium	Negligible	Negligible Not Significant

Table 151: Significance of Off-Site Road Traffic Noise

ENVIRONMENTAL RECEPTOR/RESOURCE	SENSITIVITY	MAGNITUDE OF EFFECT	SIGNIFICANCE OF EFFECT
Road links 1-21	N/A	Negligible	Negligible Not Significant

16.84 The site suitability assessment for noise sensitive development (Appendix 16.6) identifies that:

(1) the site is generally suitable for residential development subject to good acoustic design measures being implemented in respect of residential development adjacent to Harpenden Road, the Midland Main Line railway and the substation at Porters Wood Industrial Estate.

(2) vibration levels are not significant in terms of the suitability of the site for development.

(3) the area of the site allocated for a school is generally suitable for school development in terms of external noise levels. For internal noise levels, a natural ventilation strategy is likely to be suitable except where school buildings are located close to the playing fields.

ACTIONABLE MITIGATION

16.85 There are no further actionable mitigation measures applicable to construction noise and vibration beyond the application of BPM mitigation measures noting that the influence of some of these measures on the overall assessment of effects cannot readily be accounted for in the above assessment.

16.86 Subject to the development of the construction programme and methods of working, secured through a CEMP, construction noise and vibration monitoring could be implemented at key locations during specific activities to provide further management of noise generated by those activities. However, given the likely short duration of activities generating the highest noise levels in the vicinity of NSRs, this may not be a proportionate response to such an effect.

16.87 No actionable mitigation is identified for the operational phase (building services noise, sports activity noise and off-site road traffic noise) of the proposed development. The ESCs set out in Table 148 can be secured by way of a suitably worded planning condition and addressed when specifications with appropriate sound power data are developed. It is noted that, in most cases, the nearest NSRs will be the residential units introduced by the proposed development, therefore, achieving the relevant noise criteria (set out in Appendix 16.6: Site Suitability Assessment) for introduced receptors should inherently achieve the ESCs at off-site receptors. If required, standard mitigation measures (such as changes to location of external plant, selection of quieter models, and enclosure or attenuation of plant) will be considered.

16.88 In terms of proposed residential development, good acoustic design measures which should be considered and implemented where practicable for residential development adjacent to Harpenden Road, the Midland Main Line railway and Porters Wood industrial estate include:

(1) Maximising the distance between dwellings and sources of road traffic, railway and industrial noise;

(2) Orienting non-habitable rooms towards sources of road traffic, railway and industrial noise;

(3) Using the building massing to shield external amenity areas from road traffic, railway and industrial noise;

(4) Using localised screening (i.e. garden walls and fences) to provide further screening of road traffic, railway and industrial noise from external amenity areas;

(5) Building envelope design (i.e., glazing and ventilation).

16.89 The substation transformers will be enclosed as part of the acoustic mitigation scheme. As a result, tonal substation noise will not constrain development within parcel D1, however, it may still be faintly audible in some external amenity spaces, along with some other industrial noise sources on the basis that prevailing ambient noise levels are relatively low.

16.90 No actionable mitigation is identified for railway vibration in respect of proposed residential development as vibration levels are sufficiently low at the closest edge of the residential development parcels to the Midland Main Line railway.

16.91 No actionable mitigation is identified for the school development parcel unless school buildings are to be located in the northwest corner immediately adjacent to the playing fields, in which case, a natural ventilation strategy may need to be reconsidered for those teaching spaces overlooking the Woollam Playing Fields.

RESIDUAL EFFECTS

16.92 With regards to the actionable mitigation section above, there are no changes to the construction or operational assessment outcomes.

CUMULATIVE EFFESTS

16.93 The planning permission for development at Sewell Park is subject to a planning condition requiring the submission and approval of a Construction Management Plan and a Construction Environment Management Plan (condition nos. 22 and 23 refer). It can reasonably be expected that such an approved CMP and CEMP will include measures that avoid or minimise noise and vibration effects during the construction of that scheme. This would protect both the amenity of adjacent properties at Harpenden Road and Sandridgebury Lane and any new housing built and occupied as part of Woollam Park in the event that the two schemes are built simultaneously or Woollam Park precedes Sewell Park. The construction noise assessment has considered the impact of noise during the Woollam Park construction phase on residential receptors in Sewell Park, assuming that it is built and occupied before Woollam Park. The combined traffic from both developments is part of the traffic modelling and therefore associated noise and vibration effects of increased traffic on local roads is accounted for.

CONCLUSION

16.94 A baseline noise and vibration measurement survey has been carried out to determine the prevailing baseline conditions across the site and at surrounding existing NSRs. It was established that road traffic noise from Harpenden Road to the west of the site, railway noise from the Midland Mainline railway to the east of the site and industrial noise from the south of the site constitute the prevailing environmental noise climate.

16.95 The nearest NSRs are predominantly high sensitivity residential receptors located to the north, east, south and west of the site. Additionally, one school (medium sensitivity) has been identified in the study area which has also been considered as an NSR. The proposed residential receptors and proposed school located within the proposed development site have also been considered in the assessments, where applicable.

16.96 During the construction phase, construction noise is likely to result in minor adverse effects at receptor groups C, G, I, J, M, and P. Subject to the working methods selected, a significant effect could be identified at NSR group F for very short periods of time. At all other receptor groups, the effect of construction noise is predicted to be negligible.

16.97 Construction vibration could result in a minor adverse effect at NSR group M for a short period of time during the construction of the new site access. At all other NSRs construction vibration is expected to be negligible.

16.98 In respect of operational building services noise, Environmental Sound Criteria have been proposed at the NSR groups which can be secured by condition and achieved through good acoustic design when building servicing requirements are known. The effect of building services noise is negligible at all NSRs.

16.99 Sports activity noise from the proposed playing fields is negligible at all NSRs.

16.100 Changes in road traffic noise off-site are predicted to be negligible on all of the assessed road links.

16.101 In general, the site is considered to be suitable for noise sensitive development. Good acoustic design measures should be implemented where practicable where residential development is close to Harpenden Road, the Midland Main Line Railway or Porters Wood Industrial Estate, or if school buildings are located in the northwest of the school parcel overlooking the playing fields.

16.102 Overall, the effect of the proposed development on the existing noise environment is not significant. The site is generally suitable for noise and vibration sensitive development with the implementation of good acoustic design measures close to Harpenden Road, the Midland Main Line Railway, playing fields and Porters Field Industrial Estate.

17 Air quality

17.1 This chapter of the ES describes the likely significant environmental effects of the proposed development on air quality and dust. It has been compiled by Air Quality Consultants Ltd.

17.2 The proposed development when operational will generate additional traffic on local roads, emissions from which may impact on air quality at existing sensitive properties along the affected road network. The proposed development also lies close to an Air Quality Management Area (AQMA) declared by St Albans City and District Council (SADC) for exceedances of the annual mean nitrogen dioxide (NO2) objective. The proposed development will also introduce new residential exposure; therefore, an assessment is required to determine the air quality conditions that existing, cumulative and future receptors will experience. There is also the potential for dust emissions from construction activities to impact upon both existing receptors and new properties built in the early phases of the development.

17.3 The buildings throughout the proposed development are likely to be provided with energy and heating by an all-electric system (solar photovoltaic panels (PV) and air-source heat pumps (ASHPs)). There is unlikely to be any centralised combustion plant and therefore no significant point sources of emissions within the proposed development.

17.4 This Air Quality Assessment is submitted as a chapter of the Environmental Statement to support the planning application, along with the attached appendices, which are referenced throughout the chapter. These include; the professional experience of the consultants who have prepared the report, the legislative and policy context, further details of the guidance on which the construction and operational phase assessment of effects are based, the methodology of the modelling undertaken in the operational phase assessment, and best-practice mitigation measures recommended to be incorporated into the specification for the construction works commensurate with the outcome of the construction phase assessment. The following appendices are relevant to this Chapter:

Appendix 17.1	Air Quality Assessors
Appendix 17.2	Air Quality Policy Context
Appendix 17.3	Construction Dust Assessment Procedure
Appendix 17.4	EPUK & IAQM Planning and Air Quality Guidance
Appendix 17.5	Modelling Methodology
Appendix 17.6	Receptor Locations
Appendix 17.7	Baseline Dispersion Model Results
Appendix 17.8	Impact Assessment Results
Appendix 17.9	Construction Mitigation

ASSESSMENT METHODOLOGY

Study area

17.5 The study area for the operational phase assessment has been identified using professional judgement (a summary of the professional experience of the staff contributing to this assessment is provided in Appendix 17.1) based on the areas where road traffic impacts are anticipated to be greatest. It includes the application site itself and all of the roads along which the proposed development will lead to a potentially significant change in traffic flows. Specifically, the assessment has focussed on Harpenden Road to the north and south of the proposed development, Redbourn Lane, Batchwood Drive, Beech Road, St Albans Road, Marshalswick Lane, the A1081 through the St Albans Air Quality Management Area (AQMA) including Chequer Street, Sandpit Lane, Avenue Road, Lemsford Road, Beaconsfield Road, Holywell Hill and London Road. This area also incorporates the locations where the impacts of emissions from vehicles using the new access road within the proposed development are likely to be greatest. Figure 17.1 shows the study area.

17.6 The construction dust assessment considers the potential for impacts within 250m of the site boundary, or within 50 m of roads used by construction vehicles within 250m of the site. The specific areas considered are detailed in the Construction Phase Assessment of Effects section.

Consultation

17.7 The Scoping Opinion confirmed the scoping in of Air Quality into the EIA. Specific comments were provided by Hertfordshire Public Health on air quality and health and recommend that the assessment and Environmental Statement has regard for the Hertfordshire Health and Wellbeing Strategy 2022-2026[86], the National Institute for Health and Care Excellence (NICE) 2017 Guidance on Outdoor Air Pollution[87], as well as the 2019 Quality Standard (QS181)[88]. These focus on minimising road traffic pollution through a number of recommended measures and the principles of 'good design' have been followed and evidenced through the inherent measures discussed in paragraph 17.68. These include encouraging active travel as outlined in the comments.

17.8 Specifically, the approach to the assessment within this ES chapter follows a methodology sent to SADC via email by Will Wrench (Air Quality Consultants) on 8th August 2024. Specifically:

(1) Assessment of Construction Dust following Institute of Air Quality Management Guidance (IAQM)[89];

(2) Assessment operational traffic emissions using detailed dispersion modelling, covering roads within and outside the St Albans AQMA. This outlined the proposed sources of traffic data, emissions factors, backgrounds, and meteorological data;

(3) An assessment of the suitability of the site for its intended uses will be undertaken; and

(4) Assessing the impacts and significance using IAQM and Environmental Protection UK (EPUK) guidance.

Legislative / planning policy context

17.9 The following legislation, policy and planning guidance is of relevance to and has been taken into account in the Air Quality Assessment, and detailed further in Appendix 17.2.

(1) Air Quality Strategy 2007[90]
(2) Air Quality Strategy 2023[91]
(3) Clean Air Strategy 2019[92]
(4) Reducing Emissions from Road Transport: Road to Zero Strategy[93]
(5) Environment Act 2021[94]
(6) Environmental Improvement Plan 2023[95]
(7) National Planning Policy (NPPF)[96] – Paragraphs 8c, 180, 191, and 192

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86 Hertfordshire Health and Wellbeing Planning Guidance. May 2017

87 National Institute for the Heath and Care Excellence. Air Pollution: Outdoor air quality and health. https://www.nice.org.uk/guidance/ng70

88 National Institute for the Heath and Care Excellence. Air Pollution: Outdoor air quality and health Quality Standard [QS181] https://www.nice.org.uk/guidance/qs181/chapter/quality-statement-2-planning-applications#quality-statement-2-planning-applications

89 The IAQM is the professional body for air quality practitioners in the UK.

90 Defra (2007) The Air Quality Strategy for England, Scotland, Wales and Northern Ireland

91 Defra (2023) Air Quality Strategy: Framework for Local Authority Deliver. Available: https://www.gov.uk/government/publications/the-air-quality-strategy-for-england/air-quality-strategy-framework-for-local-authority-delivery

92 Defra (2019) Clean Air Strategy 2019

93 DfT (2018) The Road to Zero: Next steps towards cleaner road transport and delivering our Industrial Strategy

94 Environment Act 2021 (2021)

95 Defra (2018) A Green Future: Our 25 Year Plan to Improve the Environment. Available: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/693158/25-year-environment-plan.pdf

96 Department for Levelling Up, Housing and Communities (DLUHC) (2023) National Planning Policy Framework. Available: https://assets.publishing.service.gov.uk/media/65829e99fc07f3000d8d4529/NPPF_December_2023.pdf.

(8) NPPF Planning Practice Guidance (PPG)[97]
(9) The Building Regulations 2010 – Part F(1) of Schedule 1[98], Approved Document (AD) F[99], Building Bulletin 10116[100], Part S(1) of Schedule 1[101], Regulation 44D, and AD S[102]
(10) Hertfordshire Local Transport Plan 2018[103]
(11) SADC Local Plan (Saved and deleted Policies version from the 1994 Local Plan)[104]
(12) SADC Regulation 18 Draft Local Plan 2041[105]
(13) Hertfordshire Health and Wellbeing Planning Guidance[86]
(14) Defra Air Quality Plan for Nitrogen Dioxide (NO_2) in the UK[106]
(15) SADC Air Quality Action Plan[107]
(16) SADC Sustainability & Climate Crisis Strategy 2024-2027[108]

Assessment of process

Construction phase

17.10 Consideration has been given to the potential for significant effects from the following impacts that will occur during the demolition and construction phases:

(1) Construction dust and particulate matter emissions; and

(2) Construction traffic emissions.

17.11 The construction dust assessment considers the potential for impacts within 250 m of the site boundary; or within 50 m of roads used by construction vehicles. The assessment methodology follows the IAQM Guidance on the Assessment of Dust from Demolition and Construction[109]. This follows a sequence of steps:

Step 1: is a basic screening stage, to determine whether the more detailed assessment provided in Step 2 is required;

Step 2: *Step 2a:* determines the potential for dust to be raised from on-site works and by vehicles leaving the site. *Step 2b:* defines the sensitivity of the area to any dust that may be raised. Step 2c combines the information from Steps 2a and 2b to determine the risk of dust impacts without appropriate mitigation; and

Step 3: uses this information to determine the appropriate level of mitigation required to ensure that there should be no significant effects.

17.12 Full details of this approach are provided in Appendix 17.3.

17.13 For the assessment of construction traffic emissions, traffic generated during the construction phase can be screened against the criteria set out in the EPUK/IAQM guidance[110], as outlined in paragraph

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97 Ministry of Housing, Communities & Local Government (2019) Planning Practice Guidance

98 Ministry of Housing, Communities & Local Government (2022) The Building Regulations 2010 Schedule 1

99 HM Government (2021) Ventilation - Approved Document F. Available: https://www.gov.uk/government/publications/ventilation-approved-document-f

100 Education and Skills Funding Agency (2018) BB 101: Guidelines on ventilation, thermal comfort, and indoor air quality in schools

101 Ministry of Housing, Communities & Local Government (2022) The Building Regulations 2010 Schedule 1

102 HM Government (2021) Infrastructure for the charging of electric vehicles - Approved Document S. Available: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1057375/AD_S.pdf

103 Hertfordshire County Council (2018) Hertfordshire's Local Transport Plan 2018

104 St Albans City and District Council (2020) City and District of St Albans District Local Plan Review 1994 - Saved and deleted Policies Version (July 2020)

105 St Albans City and District Council (2020) Regulation 18 Draft Local Plan. Available: https://stalbans.objective.co.uk/file/6193723

106 Defra (2018) Supplement to the UK plan for tackling roadside nitrogen dioxide concentrations

107 St Albans City and District Council (2024) St Albans City and District Council Air Quality Action Plan

108 St Albans City and District Council (2024) Sustainability & Climate Crisis Strategy 2024-2027. Available: https://stalbans.gov.uk/sustainability-and-climate-crisis-strategy

109 IAQM (2024) Guidance on the Assessment of Dust from Demolition and Construction v2.2

17.34 to 17.36 and detailed further in Appendix 17.4. Where a development leads to an increase of less than 100 HDV movements outside of an AQMA or 25 HDV movements inside on an AQMA, as an Annual Average Daily Traffic (AADT) flow, a detailed assessment is not necessary.

Operational phase

17.14 Consideration has been given to the potential for significant effects from the following impacts associated with the complete and operational development:

(1) Suitability of the site for its proposed use, taking into account road traffic and railway emissions; and

(2) Impacts from traffic emissions associated with the proposed development on local air quality.

17.15 Once operational, the proposed development will lead to an increase in traffic on the local roads, which may affect air quality at existing residential properties. Emissions associated with road traffic on local roads and railway may also impact on air quality for future occupants of the proposed development itself (new properties). The main air pollutants of concern related to traffic emissions are NO_2 and fine particulate matter (PM_{10} and $PM_{2.5}$) and railway emissions is NO_2 and SO_2. An assessment of the operational impacts that the proposed development will have on concentrations of these pollutants has been carried out following the methodology presented below.

Screening stage

Road traffic

17.16 The first step in considering the road traffic impacts of the proposed development has been to screen the development and its traffic against the criteria set out in the EPUK/IAQM guidance[110], as detailed in paragraph 17.34- 17.36 and detailed further in Appendix 17.4. This has defined the study area outlined in paragraph 17.5. Air quality impacts on local roads beyond the defined study area will be negligible, as traffic flows generated by the proposed development will be below the screening thresholds. The following section describes the approach to dispersion modelling of road traffic emissions, which has been required for this project.

Railway locomotive

17.17 Defra guidance114 outlines that large numbers of moving diesel locomotives can give rise to high levels of NO_2 and SO_2 close to railway tracks. The guidance outlines there may be the potential for an exceedance of the NO_2 objectives as a result of emissions from diesel locomotives. Residential properties within 30m of railway lines where there are large numbers of diesel locomotive movements (these lines are identified in the Defra guidance), and where background annual mean NO_2 concentrations are greater than 25 $\mu g/m^3$, may be at risk of elevated NO_2e concentrations. Only locations which meet these criteria require further assessment.

Dispersion modelling methodology

17.18 Concentrations have been predicted using the ADMS-Roads dispersion model, with vehicle emissions derived using Defra's Emission Factor Toolkit (EFT) (v12.0) [111]. Details of the model inputs and the model verification are provided in Appendix 17.5 and the sources of information are outlined in paragraph 17.45.

17.19 Nitrogen dioxide, PM_{10} and $PM_{2.5}$ concentrations have been predicted for the following scenarios:

(1) base year 2022;

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110 Moorcroft and Barrowcliffe et al (2017) Land-Use Planning & Development Control: Planning For Air Quality v1.2

111 Defra (2024) Local Air Quality Management (LAQM) Support Website. Available: http://laqm.defra.gov.uk/

(2) the proposed earliest year of opening of the proposed development (2028) without the development; and

(3) 2028 with the proposed development.

Assessment criteria

17.20 The UK Government has established a set of air quality standards and objectives to protect human health. The 'standards' are set as concentrations below which effects are unlikely even in sensitive population groups, or below which risks to public health would be exceedingly small. They are based purely upon the scientific and medical evidence of the effects of an individual pollutant. The 'objectives' set out the extent to which the Government expects the standards to be achieved by a certain date. They take account of economic efficiency, practicability, technical feasibility and timescale. The objectives for use by local authorities are prescribed within the Air Quality (England) Regulations 2000112 and the Air Quality (England) (Amendment) Regulations 2002113.

17.21 The UK-wide objectives for NO2 and PM10 were to have been achieved by 2005 and 2004 respectively and continue to apply in all future years thereafter. Measurements across the UK have shown that the 1-hour mean NO2 objective is unlikely to be exceeded at roadside locations where the annual mean concentration is below 60 µg/m3 114. The predicted annual mean NO2 concentrations are thus used as a proxy to determine the likelihood of an exceedance of the 1-hour mean NO2 objective. Measurements have also shown that the 24-hour mean PM10 objective could be exceeded at roadside locations where the annual mean concentration is above 32 µg/m3 114. The predicted annual mean PM10 concentrations are thus used as a proxy to determine the likelihood of an exceedance of the 24-hour mean PM10 objective.

17.22 The objectives apply at locations where members of the public are likely to be regularly present and are likely to be exposed over the averaging period of the objective. Defra explains where these objectives will apply in its Local Air Quality Management Technical Guidance114. The annual mean objectives for NO2 and PM10 are considered to apply at the façades of residential properties, schools, hospitals etc.; they do not apply at hotels. The 24-hour mean objective for PM10 is considered to apply at the same locations as the annual mean objective, as well as in gardens of residential properties and at hotels. The 1-hour mean objective for NO2 applies wherever members of the public might regularly spend 1-hour or more, including outdoor eating locations and pavements of busy shopping streets.

17.23 For PM2.5, the objective set by Defra for local authorities is to work toward reducing concentrations without setting any specific numerical value. In the absence of a numerical objective, it is convention to assess local air quality impacts against the limit value (see paragraph 17.29) originally set at 25 µg/m3 and currently set at 20 µg/m3.

17.24 Defra has also recently set two new targets, and two new interim targets, for PM2.5 concentrations in England. One set of targets focuses on absolute concentrations. The long-term target is to achieve an annual mean PM2.5 concentration of 10 µg/m3 by the end of 2040, with the interim target being a value of 12 µg/m3 by the start of 2028115. The second set of targets relate to reducing overall population exposure to PM2.5. By the end of 2040, overall population exposure to PM2.5 should be reduced by 35% compared with 2018 levels, with the interim target being a reduction of 22% by the start of 2028.

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112 The Air Quality (England) Regulations, 2000, Statutory Instrument 928 (2000) HMSO, Available: http://www.legislation.gov.uk/uksi/2000/928/contents/made.

113 The Air Quality (England) (Amendment) Regulations, 2002, Statutory Instrument 3043 (2002) HMSO, Available: https://www.legislation.gov.uk/uksi/2002/3043/contents/made.

114 Defra (2022) Review & Assessment: Technical Guidance LAQM.TG22 August 2022 Version. Available: https://laqm.defra.gov.uk/wp-content/uploads/2022/08/LAQM-TG22-August-22-v1.0.pdf

115 Meaning that it will be assessed using measurements from 2027. The 2040 target will be assessed using measurements from 2040. National targets are assessed against concentrations expressed to the nearest whole number, for example a concentration of 10.4 µg/m3 would not exceed the 10 µg/m3 target.

17.25 Defra will assess compliance with the population exposure targets by averaging concentrations measured at its own background monitoring stations. This will not consider small changes over time to precisely where people are exposed (such as would relate to exposure introduced by a new development). Furthermore, as explained in Appendix 17.2, all four new targets provide metrics against which the Government can assess its own progress. While local authorities have an important role delivering the required improvements, these are expected to relate to controlling emissions and not to directly assessing PM2.5 concentrations against the targets.

17.26 In March 2023, the Department for Levelling Up, Housing and Communities (DLUHC)116 explained that the new PM2.5 targets will:

"need to be integrated into the planning system, and in setting out planning guidance for local authorities and businesses, we will consider the specific characteristics of $PM_{2.5}$. The guidance will be forthcoming in due course, until then we expect local authorities to continue to assess local air quality impacts in accordance with existing guidance."

17.27 Defra has also provided advice117 which explains that there is no current requirement to consider the new PM2.5 targets in planning decisions and that guidance to local planning authorities will be forthcoming before this position changes. In the future, when planning decisions do need to consider the new targets, the expectation is that this will focus on reducing emissions from new development rather than there being a direct requirement for planning-related air quality assessments to predict PM2.5 concentrations.

17.28 For the time being, therefore, no assessment is required, and indeed no robust assessment is possible, in relation to the new PM2.5 targets and they are not considered further.

17.29 European Union (EU) Directive 2008/50/EC118 sets limit values for NO2, PM10 and PM2.5, and is implemented in UK law through the 2010 Air Quality Standards Regulations119, 120. The limit values for NO2 and PM10 are the same numerical concentrations as the UK objectives, but achievement of these values is a national obligation rather than a local one, and concentrations are reported to the nearest whole number.

17.30 In the UK, only monitoring and modelling carried out by UK Government meets the specification required to assess compliance with the limit values. The UK Government does not normally recognise local authority monitoring or local modelling studies when determining the likelihood of the limit values being exceeded, unless such studies have been audited and approved by Defra and DfT's Joint Air Quality Unit (JAQU).

17.31 The relevant air quality criteria for this assessment are provided in Table 152.

Table 152: Air Quality Criteria for NO_2, PM_{10} and $PM_{2.5}$

POLLUTANT	TIME PERIOD	VALUE
Nitrogen Dioxide	1-hour Mean	200 µg/m^3 not to be exceeded more than 18 times a year
	Annual Mean	40 µg/m^3 [a]
PM_{10}	24-hour Mean	50 µg/m^3 not to be exceeded more than 35 times a year

116 DLUHC (2023) Planning Newsletter, Available: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1140170/03_Chief_Planners_Newsletter_March_2023.pdf

117 Defra (2023) Integrating the Environment Act air quality targets into the planning system. Proc. IAQM Routes to Clean Air conf. Manchester, 10th October 2023.

118 The European Parliament and the Council of the European Union (2008) Directive 2008/50/EC of the European Parliament and of the Council, Available: http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex%3A32008L0050

119 The Air Quality Standards Regulations 2010 Statutory Instrument 1001. (2010). HMSO. Retrieved from http://www.legislation.gov.uk/uksi/2010/1001/pdfs/uksi_20101001_en.pdf

120 As amended through The Air Quality Standards (Amendment) Regulations 2016 and The Environment (Miscellaneous Amendments) (EU Exit) Regulations 2020.

POLLUTANT	TIME PERIOD	VALUE
	Annual Mean	40 µg/m^3 [b]
$PM_{2.5}$	Annual Mean	20 µg/m^3 [c]

[a] A proxy value of 60µg/m^3 as an annual mean is used to assess the likelihood of the 1-hour mean NO_2 objective being exceeded. Measurements have shown that, above this concentration, exceedances of the 1-hour mean NO_2 objective are possible114.
[b] A proxy value of 32µg/m^3 as an annual mean is used in this assessment to assess the likelihood of the 24-hour mean PM_{10} objective being exceeded. Measurements have shown that, above this concentration, exceedances of the 24-hour mean PM_{10} objective are possible114.
[c] There is no numerical $PM_{2.5}$ objective for local authorities (see paragraph 17.29). Convention is to assess against the limit value which is currently 20µg/m^3.

Construction phase criteria

17.32 There are no formal assessment criteria for dust. In the absence of formal criteria, the approach developed by the IAQM109, has been used. A summary of this approach is outlined in paragraph 17.11 while full details are provided in Appendix 17.3.

17.33 For the assessment of construction traffic emissions, traffic generated during the construction phase can be screened against the criteria set out in the EPUK/IAQM guidance110, as outlined in paragraphs 17.13 and 17.35.

Operational phase criteria

Road traffic assessments

17.34 EPUK and the IAQM recommend a two-stage screening approach110 to determine whether emissions from road traffic generated by a development have the potential for significant air quality impacts. The approach, as described in Appendix 17.4, first considers the size and parking provision of a development; if the development is residential and is for fewer than ten homes or covers less than 0.5 ha, or is non-residential and will provide less than 1,000m2 of floor space or cover a site area of less than 1 ha, and will provide ten or fewer parking spaces, then there is no need to progress to a detailed assessment.

17.35 The second stage then compares the changes in vehicle flows on local roads that a development will lead to against specified screening criteria. The screening thresholds (described in full in Appendix 17.4 inside an AQMA are a change in flows of more than 25 Heavy Duty Vehicles (HDVs) or 100 Light Duty Vehicles (LDVs) per day; outside of an AQMA the thresholds are 100 HDVs or 500 LDVs. Where these criteria are exceeded, a detailed assessment is likely to be required, although the guidance advises that “the criteria provided are precautionary and should be treated as indicative”, and “it may be appropriate to amend them on the basis of professional judgement”.

17.36 While these screening criteria are specifically intended to act as a trigger for a detailed assessment, they can also sometimes be used to identify the extent of the road network that requires assessment. Where the change in traffic on a given road link is less than the relevant screening threshold, it is unlikely that a significant impact would occur, and these links can be disregarded unless there are additional development-related emissions affecting receptors along the link.

17.37 The ’Assessment of process’ section describes the approach to dispersion modelling of road traffic emissions, which has been required for this project.

Assessment of significance

Construction dust significance

17.38 The IAQM109 guidance describes the significance of effect as a binary judgement of significant or not significant. The guidance states that, with appropriate mitigation in place, the effects of construction dust will be 'not significant'. The assessment therefore focuses on determining the appropriate level of mitigation so as to ensure that effects will normally be 'not significant'.

Operational phase significance

17.39 There is no official guidance in the UK in relation to development control on how to assess the significance of air quality impacts. The approach developed jointly by EPUK and IAQM110 has therefore been used as the basis for the assessment, but the terms have been amended to correlate with the reporting of effects used across this ES.

17.40 Within this chapter, all receptors where the air quality objectives apply are considered to be of high sensitivity. Locations where the objectives do not apply must be considered not to be sensitive, therefore, there are no medium, low or negligible sensitivity receptors within the context of this assessment. The receptors are identified in paragraph 17.56 and Table A.17.10.

Impacts

17.41 The EPUK/ IAQM guidance110 defines impacts at individual receptors, which takes account of the percentage change in concentrations relative to the relevant air quality objective, rounded to the nearest whole number, along with the absolute concentration relative to the objective. The magnitude of change is, therefore, not considered in isolation. Table 153 sets out the method for determining the impact descriptor at individual receptors, having been adapted from the table presented in the guidance document. For the assessment criterion the term Air Quality Assessment Level or AQAL has been adopted, as it covers all pollutants, i.e. those with and without formal standards. Typically, as is the case for this assessment, the AQAL will be the air quality objective value. Note that impacts may be adverse or beneficial, depending on whether the change in concentration is positive or negative.

Table 153: Air Quality Impact Descriptors for Individual Receptors for All Pollutants

LONG-TERM AVERAGE CONCENTRATION AT RECEPTOR IN ASSESSMENT YEAR [A]	CHANGE IN CONCENTRATION RELATIVE TO AQAL [B]				
	0%	1%	2-5%	6-10%	>10%
75% or less of AQAL	Negligible	Negligible	Negligible	Minor	Moderate
76-94% of AQAL	Negligible	Negligible	Minor	Moderate	Moderate
95-102% of AQAL	Negligible	Minor	Moderate	Moderate	Substantial
103-109% of AQAL	Negligible	Moderate	Moderate	Substantial	Substantial
110% or more of AQAL	Negligible	Moderate	Substantial	Substantial	Substantial

[a] This is the "Without Scheme" concentration where there is a decrease in pollutant concentration and the "With Scheme" concentration where there is an increase.

[b] AQAL = Air Quality Assessment Level, which may be an air quality objective, EU limit or target value, GLA target or an Environment Agency 'Environmental Assessment Level (EAL)'.

[c] Values are rounded to the nearest whole number.

Effects

17.42 The overall significance of the air quality impacts is determined using professional judgement, taking account of the impact descriptors; the frequency, duration and magnitude of predicted impacts and their relationship to appropriate air quality objectives as well as the number of receptors affected. The experience of the consultants preparing the chapter is set out in Appendix 17.1. Full details of the EPUK/IAQM approach are provided in Appendix 17.4.

17.43 The EPUK/IAQM guidance differentiates between the terms impact and effect with respect to the assessment of air quality. The term impact is used to describe a change in pollutant concentration at a specific location. The term effect is used to describe an environmental response resulting from an impact, or series of impacts. The EPUK/IAQM describes the significance of effect as a binary judgement of significant or not significant.

17.44 However, to achieve consistency across the ES, the air quality impacts described in Table 153 correspond to the following terms used throughout the ES to describe an effect. Where major/moderate/minor/negligible effect is used this corresponds to substantial/moderate/slight/negligible impacts described in the EPUK/IAQM guidance. A binary judgement of significance is also provided.

Sources of information

17.45 Existing sources of emissions and baseline air quality conditions within the study area have been defined using a number of approaches:

(1) industrial and waste management sources that may affect the area have been identified using Defra's Pollutant Release and Transfer Register[121];

(2) local sources have been identified through examination of SADC Air Quality Review and Assessment reports;

(3) information on existing air quality has been obtained by collating the results of monitoring carried out by the local authority;

(4) background concentrations have been defined using Defra's 2018-based background maps[111]. These cover the whole of the UK on a 1x1 km grid. Mapped background concentrations of PM_{10} and $PM_{2.5}$ have not been adjusted; and

(5) whether or not there are any exceedances of the annual mean limit value for NO_2 in the study area has been identified using the maps of roadside concentrations published by Defra[122,123]. These are the maps used by the UK Government, together with results from national Automatic Urban and Rural Network (AURN) monitoring sites that operate to the required data quality standards to identify and report exceedances of the limit value. The national maps of roadside PM_{10} and $PM_{2.5}$ concentrations[123], which are available for the years 2009 to 2019, show no exceedances of the limit values anywhere in the UK in 2019.

17.46 Traffic data for the assessment have been provided by PJA (the project Transport Consultant) for the following scenarios:

(1) Baseline year (2022)

121 Defra (2024) UK Pollutant Release and Transfer Register. Available: http://prtr.defra.gov.uk/map-search

122 Defra (2020) 2020 NO2 projections data (2018 reference year)

123 Defra (2024) UK Ambient Air Quality Interactive Map. Available: https://uk-air.defra.gov.uk/data/gis-mapping

(2) The earliest year of opening of the proposed development (2028) without traffic associated with the complete and operational proposed development, but with cumulative schemes ("Without Scheme"); and

(3) The earliest year of opening of the proposed development (2028) with traffic associated with the fully completed and operational proposed development and cumulative schemes ("With Scheme").

17.47 The future year scenarios account for general growth of cumulative schemes with Broad Locations from the emerging Local Plan allocations and development sites for the area using TEMPro[124] growth factors, as well as specific committed development sites, as agreed with Hertfordshire County Council. These include allocations North East Harpenden Broad Location, North West Harpenden Broad Location, and proposed development Land to Rear of 112-156b Harpenden Road ('Sewell' Land) (ref 5/2021/0423/LSM)).

17.48 Further details of the traffic data used in this assessment are provided Appendix 17.5.

Assumptions

17.49 It is necessary to make a number of assumptions when carrying out an air quality assessment; in order to account for some of the uncertainty in the approach, as described above, assumptions made have generally sought to reflect a realistic worst-case scenario. Key assumptions made in carrying out this assessment include:

(1) the assumption that the proposed development is complete and fully occupied and operational in 2028. This will have overestimated the traffic generation given the phased construction programme, the development is unlikely to be fully occupied in 2028, therefore it will not be generating its full traffic volumes until after this year; and

(2) that the Luton Airport meteorological monitoring station appropriately represents conditions in the study area (this is discussed further in Appendix 17.5).

Assessment limitations

17.50 There are many components that contribute to the uncertainty of modelling predictions. The road traffic emissions dispersion model used in this assessment is dependent upon the traffic data that have been input, which will have inherent uncertainties associated with them. There are then additional uncertainties, as models are required to simplify real-world conditions into a series of algorithms.

17.51 An important stage in the process is model verification, which involves comparing the model output with measured concentrations (see Appendix 17.5). Because the model has been verified and adjusted, there can be reasonable confidence in the prediction of base year (2022) concentrations. TG22114 provides guidance on the evaluation of model performance. Based on the analysis shown in Appendix 17.5, the model performance is considered to be good.

17.52 Predicting pollutant concentrations in a future year will always be subject to greater uncertainty. The model cannot be verified in the future, and it is necessary to rely on a series of projections provided by DfT and Defra as to what will happen to traffic volumes, background pollutant concentrations and vehicle emissions. Historic versions of Defra's EFT tended to over-state emissions reductions into the future. However, analyses of the more recent versions of Defra's EFT carried out by AQC125, 126 suggest that, on balance, NOx concentrations are likely to decline more quickly in the future, on

124 DfT (2024) Trip End Model Presentation Program (TEMPro)

125 AQC (2020) Performance of Defra's Emission Factor Toolkit 2013-2019

126 AQC (2020) Comparison of EFT v10 with EFT v9

average, than predicted by previous versions of the EFT, especially against a base year of 2016 or later. Whilst such an analysis has not been undertaken by AQC for EFT v12.0, it is considered that using EFT v12.0 for future-year forecasts in this report provides a robust assessment, given that the model has been verified against measurements made in 2022.

BASELINE CONDITIONS

17.53 The proposed development lies approximately 2.5 km north of the St Albans AQMA declared by St Albans City and District Council (SADC) for exceedances of the annual mean NO2 and 24-hour mean particulate matter (PM10) objectives, as highlighted in Figure 17.1.

17.54 The application site is bounded by Sandridgebury Lane to the southwest and northeast, the Midland Mainline railway to the east, residential properties to the south-west, agricultural land and playing fields to the north and Harpenden Road to the west.

Receptors

17.55 The Air Quality Strategy 200790 and the Air Quality Strategy 202391 explain that air quality standards and objectives were determined based on expert recommendations and represent "levels at which no significant health effects would be expected in the population as a whole". As outlined in paragraph 17.22, the objectives apply at locations where members of the public are likely to be regularly present and are likely to be exposed over the averaging period of the objective.

17.56 Concentrations of NO2, PM10 and PM2.5 have been predicted at a number of locations both within, and close to, the proposed development. Receptors have been identified that represent a range of exposure, including worst-case locations (these predominantly being at the façades of the residential properties closest to the sources). When selecting receptors, particular attention has been paid to assessing impacts close to junctions, where traffic may become congested and where there is a combined effect of several road links, and close to those roads where the traffic increases as a result of the proposed development will be greatest. At locations further from the road edge, it can be assumed that concentrations and impacts will be lower114. Selected receptors may be representative of air quality conditions at a number of properties; consideration has been given to how many sensitive locations each modelled receptor represents when considering the impacts of the proposed development and the overall significance of effects. The sensitivities of the selected receptors are presented in Table 154, while Table A.17.10 details the location and description of the receptors alongside Figure 17.2 and Figure 17.3. In addition, concentrations have been predicted at three locations within the cumulative development associated with Land to Rear of 112-156b Harpenden Road 'Sewell Trust' (ref 5/2021/0423/LSM), which are situated in worst-case locations, closest to the affected road network.

Table 154: Sensitivity of air quality receptors

ENVIRONMENTAL RECEPTOR/RESOURCE	SENSITIVITY
Residential properties	High
School	High
Community / care centre	High

Industrial sources

17.57 No significant industrial sources have been identified that are likely to affect the proposed development, in terms of air quality.

Local air quality monitoring

17.58 SADC does not currently operate any automatic monitoring stations within its area. SADC operates a number of NO2 monitoring sites using diffusion tubes prepared and analysed by Gradko International Ltd (using the 20% TEA in water method). These include several deployed on St Peter's Street, Chequer Street, Holywell Hill, as well as ones installed on High Street, London Road, Catherine Street and Hatfield Road. Annual mean results for the years 2017 to 2022 are summarised in Table 155, while the monitoring locations are shown in Figure 17.4. The monitoring data have been taken from SADC's 2023 Annual Status Report127.

17.59 While 2020 and 2021 results have been presented in this Section for completeness, they are not relied upon in any way as they will not be representative of 'typical' air quality conditions due to the considerable impact of the Covid-19 pandemic on traffic volumes and therefore pollutant concentrations.

Table 155: Summary of Annual Mean NO_2 Monitoring (2017 – 2022) (µg/m^3)

SITE NO.	SITE TYPE	LOCATION	2017	2018	2019	2020	2021	2022
SA101	Roadside	Museum Hatfield Road	28.5	28.3	29.1	19.3	21.3	21.1
SA136	Kerbside	St Peter's Street	**52.5**	**48.5**	**45.6**	35.3	38.6	34.2
SA137	Kerbside	High Street	-	-	**41.8**	25.7	24.8	31.4
SA138	Kerbside	Peahen PH Holywell Hill	**41.2**	**45.2**	**43.6**	27.5	29.5	31.6
SA143	Kerbside	London Road West	-	**42.4**	**40.8**	25.6	26.2	28.2
SA144	Kerbside	Forester House 1 St Peter's Street	**46.5**	39.7	38.2	28.7	30.4	29
SA146	Urban Background	Forrester House 2 St Peters Street	-	30.6	29.6	19.0	21.6	21.7
SA147	Urban Background	Shops St Peter's Street	-	35.2	39.7	24.4	25.7	24.5
SA148	Kerbside	Chequer Street	-	**52.7**	**49.0**	35.8	38.4	35.6
SA157	Kerbside	Catherine Street	-	**46.2**	**40.8**	29.1	32.1	29.1
SA160	Roadside	Hollywell Hill	-	**59.3**	**54.7**	36.7	39.2	39.4

[a] Exceedances of the objectives are shown in bold.

17.60 As shown in Table 155, annual mean NO_2 concentrations have not exceeded the objectives at any monitoring site presented since 2019, when the objective was exceeded at several kerbside and roadside sites within and adjacent to the AQMA along St Peter's Street, Holywell Hill, London Road and Chequer Street, as well as along Catherine Street. The objective was also exceeded along these roads prior to 2019 where monitoring data were available. No exceedances of the objective have been recorded between 2017 and 2022 at the urban background sites along St Peter's Street and at the roadside site adjacent to Hatfield Road. There is a general downward trend in concentrations between 2017 and 2022, notwithstanding the years impacted by the Covid-19 pandemic.

127 St Albans City and District Council (2023) 2023 Air Quality Annual Status Report

17.61 No monitoring of PM_{10} or $PM_{2.5}$ concentrations is undertaken in SADC.

Exceedances of limit value

17.62 There are no AURN[128] monitoring sites within the study area with which to identify exceedances of the annual mean NO_2 limit value. Defra's roadside annual mean NO_2 concentrations[123] which are used to identify and report exceedances of the limit value, do not identify any exceedances within 1 km of the Application site in 2017. As such, there is considered to be no risk of a limit value exceedance in the vicinity of the proposed development by the time that it is operational.

Background concentrations

17.63 Estimated background concentrations in the study area are set out in Table 156 and are all well below the objectives. A range of values is presented as the study area covers multiple 1x1 km grid squares.

Table 156: Estimated annual mean background pollutant concentrations in 2022 and 2028 (µg/m^3)

YEAR	NO_2	PM_{10}	$PM_{2.5}$
2022	10.5 – 14.7	13.8 – 15.0	9.1 – 10.2
2028	8.7 – 12.1	13.3 – 14.4	8.7 – 9.7
Objective	40	40	20 [a]

[a] The 20 µg/m^3 $PM_{2.5}$ objective, which was to be met by 2020, is not in Regulations and there is no requirement for local authorities to meet it.

Baseline dispersion model results

17.64 Baseline concentrations of NO2, PM10 and PM2.5 have been modelled at each of the existing receptor locations (see Table A.17.10 and Figure 17.2 for receptor locations). The results, which cover both the existing (2022) and future year (2028) baseline ("Without Scheme"), are set out in Table A.17.11 for NO2 and Table A.17.12 for PM10 and PM2.5 in Appendix 17.7. The modelled road components of nitrogen oxides have been increased from those predicted by the model based on a comparison with local measurements (see Appendix 17.5 for the verification methodology). The baseline dispersion model results for NO2 range from 10.7 µg/m3 to 24.7 µg/m3. The results for PM10 and PM2.5 range from 13.4 µg/m3 to 15.7 µg/m3 and 8.8 µg/m3 to 10.4 µg/m3, respectively.

17.65 As shown in Table A.17.11 and Table A.17.12 in Appendix 17.7, the predicted annual mean concentrations of NO2, PM10 and PM2.5 are below the annual mean objectives in both 2022 and 2028 at all modelled receptors. It is also, therefore, unlikely that the 1-hour mean NO2 and 24-hour mean PM10 objectives will also be exceeded (see paragraph 17.21).

17.66 The results are consistent with the conclusions of SADC in its air quality review and assessment work in that there are no measured exceedances of the annual mean NO2 objective in 2022, and none have been modelled.

128 Defra (2024) Defra AURN Archive

INHERENT AND STANDARD MITIGATION

Construction phase

17.67 Measures to mitigate dust emissions will be required during the construction phase of the development to minimise effects upon nearby sensitive receptors. The IAQM guidance focuses on determining the appropriate level of mitigation to ensure that effects will normally be 'not significant'. The mitigation measures required are outlined in Appendix 17.6 and will be written into Construction Environmental Management Plan (CEMP). This is a standard mitigation requirement for the construction phases and will be developed to control the effects of dust from the construction works and encourage the sustainable use of transport to and from the site. This will be furthered by the adoption of a Travel Plan.

Operational phase

17.68 The proposed development incorporates the following good design and best practice measures, aligning with those specified in the EPUK/IAQM guidance110 and those outlined in the NICE Guidance[87] and Standard[88], to mitigate emissions from the completed and operational development and have been accounted for in the Assessment of Environmental Effects section:

1. Scheme design such that the most sensitive uses (retirement living, school and highest density of residential dwellings) are in the centre of the proposed development, away from sources of pollution (specifically Harpenden Road);

2. Setting back of the residential properties from the railway line by approximately 30 m;

3. New roads constructed away from any existing sensitive receptors, wherever possible, and existing roads within the Application site (Sandridgebury Lane and Valley Road) are proposed to be closed and or re-routed to facilitate active travel movements;

4. An Outline Parking Strategy which proposes low levels of car parking and a series of infrastructure and measures to facilitate sustainable travel choices and contribute to the vision for the development of low car usage and high uptake of sustainable travel modes;

5. Active interventions along three corridors in St Albans to contribute to the Harpenden County Council Local Cycle and Walking Infrastructure Plan to encourage a positive uptake in walking and cycling to and from the proposed development and modal shift in background traffic from private car use to active travel modes;

6. During early development phases, bus stop infrastructure is proposed on the Harpenden Road at the new access junction, along with appropriate walking routes, to allow residents to utilise the existing bus service (321). For later development phases, funding for re-routing of an existing bus service (653) into the site is proposed;

7. A central mobility hub is proposed within the development, which will integrate shared and active travel modes, along with provision of electric vehicle (EV) charging infrastructure. Public car parking will be limited to discourage vehicle movements for internal trips;

8. Provision of EV charging infrastructure for parking bays associated with residential properties in line with the Building Regulations; and

9. Use of an all-electric system for the routine provision of energy and heating to the proposed development to avoid the need for on-site combustion.

Construction phase

17.69 The construction of the proposed development will consist of four phases, with an overall build programme of ten years from 2026 to 2036:

Phase 1: the formation of the relocated playing fields at Longcroft. This will involve earthworks to create a level platform and the laying out of grass pitch, the formation of a hardstanding for car parking, and the erection of a pavilion and excavation for drainage infrastructure. This phase is expected to take two years.

Phases 2, 3 and 4: the construction of residential properties, care and neighbourhood facilities, primary school and mobility hub. These phases will predominantly comprise soil clearance, excavation of foundations, the installation of drainage infrastructure and highways, and the erection of buildings. Earthworks will be required to create development plateau. Highway improvement works (pedestrian and cycle routes) outside the site are also expected. These phases are anticipated to cumulatively take eight years, broadly progressing north to south across the site.

17.70 Since the construction period will take place over a prolonged period, it is anticipated that occupation will take place upon completion of each phase (i.e. construction and occupation will coincide). The assessment, therefore, conservatively takes account of this phasing to ensure suitable mitigation measures are applied across the entire construction period to minimise the cumulative risk of dust effects.

Construction traffic

17.71 Over the construction period, the proposed development is anticipated to generate traffic comprising the movement of workers and the importing and exporting materials. It is envisaged that movements of workers will originate from a variety of locations, with the majority residing within Hertfordshire, with a core coming from nearby places including St. Albans, Harpenden, Hatfield, Luton and Hemel Hempstead.

17.72 In the absence of detailed information on the forecast vehicle movements throughout the construction phase and build-out of the proposed development, the project Transport Consultant (PJA) estimate that the proposed development will generate approximately 20 two-way heavy vehicle movements and 55 light vehicle movements (predominantly staff vehicles) per day during peak construction vehicle activity (road surfacing and concrete pours). Light vehicle trips would be expected to disperse across the local road network within the vicinity of the site, while heavy vehicles would be expected to route to and from the site on the major roads, with routing typically controlled via the CEMP/CTMP, which looks to restrict the use of lower order roads with residential properties. The peak traffic generation during the construction phase is below the IAQM screening criteria for outside an AQMA, and in reality, will be significantly lower as an annual average. It is therefore not considered necessary to assess the impacts of traffic emissions during the construction phase and it can be concluded that the proposed development will not have a significant impact on local roadside air quality as a result of construction traffic emissions.

On site exhaust emissions

17.73 The IAQM guidance (IAQM, 2024) states:

"Experience of assessing the exhaust emissions from on-site plant (also known as non-road mobile machinery or NRMM) and site traffic suggests that they are unlikely to make a significant impact on local air quality, and in the vast majority of cases they will not need to be quantitatively assessed. For site plant and on-site traffic, consideration should be given to the number of plant/vehicles and their operating hours and locations to assess whether a significant effect is likely to occur".

17.74 The proposed development is large, with the majority of the site area being more than 50 m from any sensitive receptors; the closest existing residential properties are located between the Phase 2 area to the west and the 'Sewell' Land development, and the nearest cumulative receptors being those within that development. During construction, the siting of NRMM will consider the proximity to these nearby sensitive receptors, including any new sensitive uses that are occupied during the construction phase; the distance between NRMM and sensitive properties will be maximised as far as possible. Furthermore, when not in use, all vehicles and plant will be switched off.

17.75 It is, therefore, judged that there is no risk of significant effects at existing or future receptors as a result of on-site machinery emissions.

Construction dust and particulate matter emissions

17.76 The construction works will give rise to a risk of dust impacts during earthworks and construction, as well as from trackout of dust and dirt by vehicles onto the public highway. Step 1 of the assessment procedure is to screen the need for a detailed assessment. There are receptors within the distances set out in the guidance (see Appendix 17.3*)* therefore, a detailed assessment is required. The following section sets out Step 2 of the assessment procedure.

Potential dust emission magnitude

Demolition

17.77 There is no requirement for demolition on the site.

Earthworks

17.78 The characteristics of the soil at the site have been defined using the British Geological Survey's UK Soil Observatory website[129], as set out in Table 157. Overall, it is considered that when dry, this soil has the potential to be moderately dusty.

Table 157: Summary of soil characteristics

CATEGORY	RECORD
Soil Layer Thickness	Deep, Intermediate Shallow
Soil Parent Material Grain Size	Mixed (Argillaceous [a] – Arenaceous [b] – Rudaceous [c])
European Soil Bureau Description	Chalk, Floodplain Sand/Gravel, Colluvium
Soil Group	Light (Sandy) to Medium (Sandy)
Soil Texture	Clayey Loam [d], Sandy to sandy Loam, Chalky Silty Loam

[a] grain size < 0.06 mm.
[b] grain size 0.06 – 2.0 mm.
[c] grain size > 2.0 mm.
[d] a loam is composed mostly of sand and silt.

17.79 The site covers approximately 500,000 m^2, most of which will be subject to earthworks involving excavation, haulage, tipping, stockpiling and landscaping. The earthworks will be required for all phases of the development and will arise mainly from vehicles travelling over unpaved ground (up to 800 m in length) and from the handling of dusty materials (such as dry soil). Based on the example definitions set out in Appendix 17.3*,* the dust emission class for earthworks is considered to be *large*.

[129] British Geological Survey (2023) UK Soil Observatory Map Viewer, Available: http://mapapps2.bgs.ac.uk/ukso/home.html.

Construction

17.80 The proposed development involves the construction of up to 1, 000 brick built residential properties, with a total building volume of more than 900, 000 m^3. Dust will arise from vehicles travelling over unpaved ground, the handling and storage of dusty materials, and from on site concrete batching, if required. Based on the example definitions set out in Appendix 17.3, the dust emission class for construction is considered to be *large*.

Trackout

17.81 The exact number of heavy vehicles accessing the site, which may track out dust and dirt, is currently unknown, however PJA have indicated this to be 20 outward heavy vehicle movements per day based on a nearby residential development of a similar build-out rate (see paragraph 17.72). While the length of unpaved road along which vehicles may travel is up to 800 m, the surface material is considered to be moderately dusty with low clay content (see Table160). Based on the example definitions set out in Appendix 17.3, the dust emission class for trackout is considered to be medium.

Table 158: Summary of dust emission magnitude

SOURCE	DUST EMISSION MAGNITUDE
Earthworks	Large
Construction	Large
Trackout	Medium

Sensitivity of the area

17.82 This assessment step combines the sensitivity of individual receptors to dust effects with the number of receptors in the area and their proximity to the site. It also considers additional site-specific factors such as topography and screening, and in the case of sensitivity to human health effects, baseline PM10 concentrations.

17.83 The IAQM guidance explains that residential properties are 'high' sensitivity receptors to dust soiling, while places of work are 'medium' sensitivity receptors (Appendix 17.3). Residential properties are also classified as being of 'high' sensitivity to human health effects, while places of work are classified as being of 'medium' sensitivity. There are approximately eight existing residential properties and 18 properties associated with the Sewell Park development within 20m of the site, principally located adjacent to the western boundary, while 26 commercial and office buildings are located within 20 m of the site to the south (see Figure 17.5).

17.84 In considering the proposed phased occupation, and to ensure a conservative approach, it is assumed that there could be over 100 new properties exposed to construction dust within 20 m of the construction works over the construction period.

17.85 The IAQM guidance109 explains that there is a risk of material being tracked 250 m from the site exit. The site benefits from direct frontage on Harpenden Road from which construction vehicles will gain access. It has been assumed that vehicles will exit the site and travel both the north and south along Harpenden Road. There are approximately 13 residential properties within 20 m of the roads along which material could be tracked (see Figure 17.6), and there could be several new properties and a care facility associated with the proposed development exposed to construction dust within 20 m of the trackout route over the construction period.

Sensitivity of the area to effects from dust soiling

17.86 Using the information set out in paragraph 17.83 and Figure 17.5 alongside the matrix set out in Appendix 17.3, the area surrounding the on site works is of 'high' sensitivity to dust soiling. While the woodland to the south of the site boundary will provide some protection from dust, this does not alter the sensitivity rating which has been predominantly based on 'high' sensitivity residential properties to the west. Using the information set out in paragraph 17.85 and *Figure 17.6* alongside the same matrix, the area is also of 'high' sensitivity to dust soiling due to trackout.

Sensitivity of the area to any human health effects

17.87 The matrix in Appendix 17.3 requires information on the baseline annual mean PM_{10} concentration in the area. Receptors E1 and E2 in Table A17.12 are all within 30 m of the site. The maximum predicted baseline PM_{10} concentration at these receptors is 14.7 µg/m^3 (Table A.17.12), and this value has been used. Using the information set out in paragraph 17.83 alongside the matrix in Appendix 17.3, the area surrounding the on site works is of 'medium' sensitivity to human health effects. Using the information set out in paragraph 17.85 alongside the same matrix, the area surrounding roads along which material may be tracked from the site is also of 'low' sensitivity.

Sensitivity of the area to any ecological effects

17.88 The guidance considers designated ecological sites with dust sensitive features within 50 m to have the potential to be impacted by the construction works. While there are no SSSIs within 50 m of the construction or trackout areas, an area of Ancient Woodland is situated adjacent to the southern boundary of the site (*see Figure 17.5*). The project Ecologist (FPCR) has advised that significant air pollution impacts on ecological sites within the vicinity of the proposed development are unlikely. As such, it has been conservatively judged, that the locally designated Ancient Woodland is of 'low' sensitivity to ecological effects.

Summary of the area sensitivity

17.89 Table 159 summarises the sensitivity of the area around the proposed construction works.

Table 159: Summary of the area sensitivity

EFFECTS	SENSITIVITY OF THE SURROUNDING AREA	
	ON-SITE WORKS	TRACKOUT
Dust Soiling	High sensitivity	High sensitivity
Human Health	Medium sensitivity	Low sensitivity
Ecological	Low sensitivity	Low sensitivity

Risk and significance of construction dust effects

17.90 The dust emission magnitudes in Table 158 have been combined with the sensitivities of the area in order to assign a risk category to each activity. The resulting risk categories for the four construction activities, without mitigation, are set out in Table 160. These risk categories have been used to determine the appropriate level of mitigation as set out in Actionable Mitigation section (Step 3 of the assessment procedure).

Table 160: Summary of the air quality risks without mitigation

SOURCE	DUST SOILING	HUMAN HEALTH	ECOLOGY
Earthworks	High risk	Medium risk	Low risk
Construction	High risk	Medium risk	Low risk

SOURCE	DUST SOILING	HUMAN HEALTH	ECOLOGY
Trackout	Medium risk	Low risk	Low risk

17.91 The IAQM guidance does not provide a method for assessing the significance of effects before mitigation, and advises that pre-mitigation significance should not be determined. With appropriate mitigation in place, the IAQM guidance is clear that the residual effect will normally be 'not significant'109.

Operational phase

Operational traffic impacts

17.92 The proposed development will generate traffic volumes that exceed the EPUK/IAQM screening thresholds, as defined by the study area (see paragraph 17.5), therefore a detailed assessment is required.

17.93 Predicted annual mean concentrations of NO2 in 2028 for existing and cumulative 'Sewell' receptors are set out in Appendix 17.8 in Table A.17.13 for both the "Without Scheme" and "With Scheme" scenarios, while Table A.17.14 presents those for PM10 and PM2.5. The impact at each receptor is also described using the impact descriptors given in Table 153, along with the sensitivity of the receptors. In summary, the annual mean results for NO2 range from 10.9 µg/m3 to 25.4 µg/m3. Predicted concentrations range between 13.4 µg/m -15.8 µg/m and 8.8 µg/m -10.4 µg/m for PM10 and PM2.5, respectively. The impacts at all receptors are judged to be 'negligible'.

17.94 The annual mean NO2, PM10 and PM2.5 concentrations are well below the objective at all existing and cumulative 'Sewell' receptors in 2028 with or without the proposed development. Furthermore, as annual mean NO2 and PM10 concentrations are below 60 µg/m3, and 32 µg/m3 respectively, it is unlikely that the 1-hour NO2 and 24-hour mean PM10 objectives will be exceeded at any of the receptors.

Significance of operational air quality effects

17.95 While the changes in air quality concentrations are considered to be long-term and permanent, the magnitude of change relative to the AQAL at receptors results in a small change in concentrations commensurate with a negligible impact. On this basis, and applying professional judgement, pollutant concentrations at all of the selected worst-case, high sensitivity existing receptors along the local road network will be well below the air quality objectives, the significance of operational air quality effects without mitigation are judged to be negligible and 'not significant'.

Site suitability

17.96 Predicted air quality conditions for future residents and users of the proposed development, taking account of emissions from the adjacent road network, are set out in Table 161. These represent worst-case (ground floor) concentrations in the earliest year of occupation (2028).

Table 161: Predicted Annual Mean NO_2, PM_{10} and $PM_{2.5}$ Concentrations in 2028 for New Receptors within the proposed development (µg/m^3)

RECEPTOR	NO_2	PM_{10}	$PM_{2.5}$
P1	18.3	14.5	9.4
P2	17.4	14.4	9.4
P3	13.9	14.2	9.3
P4	12.7	14.1	9.2
P5	13.7	14.2	9.3

RECEPTOR	NO_2	PM_{10}	$PM_{2.5}$
Objective / Criterion	40	32 [a]	20 [b]

[a] While the annual mean PM_{10} objective is 40 µg/m³, 32 µg/m³ is the annual mean concentration above which an exceedance of the 24-hour mean PM_{10} objective is possible, as outlined in LAQM.TG22[114]. A value of 32 µg/m³ is thus used as a proxy to determine the likelihood of exceedance of the 24-hour mean PM^{10} objective, as recommended in EPUK & IAQM guidance[110].

[b] There is no numerical $PM_{2.5}$ objective for local authorities (see paragraph 17.29). Convention is to assess against the limit value which is currently 20 µg/m³.

17.97 All of the predicted concentrations are well below the objectives. This accords with the current local roadside air quality monitoring data (see Table 158) which shows annual mean concentrations of NO_2 to be below the objective in recent years, except at several monitoring sites within or adjacent to the AQMA, (along Chequer Street and Catherine Street) where concentrations have been above the objective in 2019 and several years prior. The receptors closest to Harpenden Road (P1 and P2) will be set further back from the road than the monitoring sites and in a less urbanised area, therefore pollutant concentrations at the façades of the buildings are anticipated to be lower than those measured roadside given concentrations reduce with distance from the source114. Concentrations predicted at locations nearer to the centre of the proposed development (P3, P4 and P5) are closer to background concentrations (see Table 156), consistent with DEFRA guidance114 which states that pollutant concentrations will be close to background conditions at distances more than 50m from roads.

17.98 The Midland Mainline runs through the proposed development serving St Albans Station. While this railway line is listed as one of concern in Defra guidance114 with a high volume of diesel rains, emissions from locomotives can be screened out as insignificant since the proposed development falls outside the significance criteria outlined in the Defra guidance; background annual mean NO2 concentrations at the site are below 25 µg/m3 (see Table 156) and the closest sensitive receptors are proposed more than 30m from the railway line.

17.99 It is concluded that air quality for future residents and users within the proposed development will be acceptable. A summary of the environmental effects is provided in the following tables:

Table 162: Magnitude of change from air quality impacts

ENVIRONMENTAL RECEPTOR/RESOURCE	MAGNITUDE OF CHANGE
Construction Dust	The IAQM guidance110 does not provide a method for consideration of the magnitude of change in isolation
Operational Road Traffic impacts on existing and cumulative receptors	The IAQM guidance110 does not provide a method for consideration of the magnitude of change in isolation
Proposed Residential Properties [a]	Receptors are introduced as part of the scheme and therefore not subject to a change

Table 163: Significance of air quality effects

ENVIRONMENTAL RECEPTOR/RESOURCE	SENSITIVITY	MAGNITUDE OF EFFEC	SIGNIFICANCE OF EFFECT
Construction Dust	High	Negligible	Negligible / 'Not Significant' a
Operational Road Traffic impacts on existing receptors	High	Negligible	Negligible/ 'Not Significant'
Proposed Residential Properties	High	Negligible	Negligible/ 'Not Significant'

[a] As stated in paragraph 17.91, the IAQM guidance does not provide a method for assessing the significance of effects before mitigation, and advises that pre-mitigation significance should not be determined. With appropriate mitigation in place, the residual effect will normally be 'not significant'.

ACTIONABLE MITIGATION

Construction phase

17.100 The site has been identified as a high risk site during earthworks and construction, and medium risk for trackout, as set out in Table 162. Comprehensive guidance has been published by the IAQM109 that describes measures that should be employed, as appropriate, to reduce the impacts, along with guidance on monitoring during demolition and construction130 .This reflects best practice experience and has been used, together with the professional experience of the consultant who has undertaken the dust impact assessment (see Appendix 17.1) and the findings of the assessment, to draw up a set of measures that should be incorporated into the specification for the works. These mitigation measures described in Appendix 17.6 are standard and no additional specific actionable measures are required.

17.101 A Dust Management Plan could however be required by the Local Authority to outline reporting and dust control processes in more detail.

17.102 The EPUK/IAQM guidance110 predates the recent publication by Defra of long-term air quality targets for PM2.5. While it is not appropriate to determine individual planning applications based on whether future PM2.5 concentrations in an area will be above or below the concentration target, it is nevertheless appropriate that new development contributes to meeting the national targets by ensuring that air quality is taken into account in development design. It is considered that the inherent and standard mitigation proposed will ensure that the proposed development does not conflict with local actions to reduce PM2.5 concentrations in the long-term.

Operational phase

17.103 The assessment has demonstrated that the overall air quality effect of the proposed development will be 'not significant'; it will not introduce any new exposure into areas of unacceptable air quality, nor will the development-generated traffic emissions have a significant impact on local air quality. It is, therefore, not considered appropriate to propose further mitigation measures for this development. Measures to reduce pollutant emissions from road traffic are principally being delivered in the longer term by the introduction of more stringent emissions standards, largely via European legislation (which is written into UK law). SADC's Air Quality Action Plan will also be helping to deliver improved local air quality.

17.104 A Travel Plan for the development setting out measures to further encourage the use of sustainable means of transport (public, cycling and walking) would also further reduce traffic generated by the development.

RESIDUAL EFFECTS

Construction phase

17.105 The IAQM guidance is clear that, with appropriate mitigation in place, the residual effects will normally be 'not significant'. The mitigation measures set out in Appendix 17.6 are based on the IAQM guidance. With these measures in place and effectively implemented the residual effects are judged to be 'not significant'.

17.106 The IAQM guidance does, however, recognise that, even with a rigorous dust management plan in place, it is not possible to guarantee that the dust mitigation measures will be effective all of the time, for instance under adverse weather conditions. During these events, short-term dust annoyance may

[130] IAQM (2018) Guidance on Air Quality Monitoring in the Vicinity of Demolition and Construction Sites v1.1

occur, however, the scale of this would not normally be considered sufficient to change the conclusion that, overall, the effects will be 'not significant'.

Operational phase

17.107 The residual impacts will be the same as those identified in the assessment of environmental effects section. The overall effects of the proposed development will be 'not significant'.

Table 164: Significance of air quality effects of the proposed development

ENVIRONMENTAL RECEPTOR/RESOURCE	SIGNIFICANCE OF RESIDUAL EFFECT
Construction dust	Negligible / 'not significant'
Operational road traffic impacts on existing receptors	Negligible / 'not significant'
Proposed residential properties	Negligible / 'not significant'

CUMULATIVE EFFECTS

17.108 The planning permission for development at Sewell Park is subject to a planning condition requiring the submission and approval of a Construction Management Plan and a Construction Environment Management Plan (condition nos. 22 and 23 refer). It can reasonably be expected that such an approved CMP and CEMP will include measures that avoid or minimise disamenity dust and emissions from construction related machinery during that period. This would protect both the amenity of adjacent properties at Harpenden Road and Sandridgebury Lane and any new housing built and occupied as part of Woollam Park in the event that the two schemes are built simultaneously or Woollam Park precedes Sewell Park. The construction dust risk assessment has considered the impact of emissions on future residents within both Sewell Park and Woollam Park. If built simultaneously, regular liaison meetings with Sewell Park, to ensure plans are co-ordinated and dust and particulate matter emissions are minimised, will be undertaken. The combined traffic from both developments is part of the traffic modelling and future receptors within Sewell Park have been included, and therefore associated air quality effects of increased traffic on local roads is accounted for.

CONCLUSION

17.109 The assessment has considered the impacts of the proposed development on local air quality in terms of dust and particulate matter emissions during construction and emissions from road traffic generated by the completed and occupied development. It has also identified the air quality conditions that future residents and users will experience.

Construction phase

17.110 The construction works have the potential to create dust. During construction it will therefore be necessary to apply a package of mitigation measures to minimise dust emissions. Appropriate measures have been recommended and, with these measures in place, it is expected that any impacts, which will be short-term, and residual effects will be 'not significant'.

Operational phase

17.111 Air quality conditions for future residents and users of the proposed development have been shown to be acceptable, with concentrations well below the air quality objectives throughout the site in the earliest year of occupation.

17.112 The assessment has also demonstrated that pollutant concentrations will be well below the objectives at all existing and cumulative receptors in 2028, with or without the proposed development, and that

the emissions from the additional traffic generated by the proposed development will have a '*negligible impact and negligible* /'not significant' significance of effect on air quality conditions at all existing receptors along the affected local road network over the long-term.

17.113 Taking into account these conclusions, it is judged that the proposed development is consistent with Paragraph 191 of the NPPF, being appropriate for its location both in terms of its effects on the local air quality environment and the air quality conditions for future residents and users. It is also consistent with Paragraph 192, as it will not affect compliance with relevant limit values or national objectives.

17.114 The proposed development is also consistent with Policy HW1 in the Draft SADC Local Plan by comprising suitable measures designed into the scheme to mitigate air pollution exposure of future users and nearby residential properties. The proposed development also accords with Strategic Policy SP8 by considering future air quality impacts from transport, and contributing to wider schemes to mitigate development-generated transport emissions. Furthermore, the proposed development aligns with Strategic Policy SP13 through the provision of infrastructure to encourage active and sustainable transport, and Policy HW4 by being appropriate for its location, with respect to air quality, by not significantly affecting or being affected by existing developments, and those proposed, within its surroundings.

17.115 In addition, the proposed development algins with measures Hertfordshire County Council are taking to reduce emissions and improve air quality across Hertfordshire through promoting a shift in travel behaviour towards active and sustainable modes and providing infrastructure to support the uptake of Ultra-Low Emission Vehicles (Policy 19 and Policy 20 of the Hertfordshire Local Transport Plan). The proposed development is also consistent with the priority measures identified in the adopted and draft SADC Air Quality Action Plans which similarly target a shift from private cars to active and public travel and provision of EV charging infrastructure within new developments, and does not conflict with similar measures within SADC's Sustainability and Climate Crisis Strategy aimed at reducing air pollution from transport.

18 Cumulative effects

18.1 The EIA Regulations require an ES to identify the likely effects of development on the environment when taken cumulatively with other environmental effects and any current or prospective development in the vicinity.

18.2 Whilst there is no formal definition within legislation or the NPPG of what constitutes a "cumulative effect" and no prescribed methodology on how to assess such interactions between environmental receptors or other development sites, for this purpose the following has been considered to represent a cumulative impact: *"Impacts that result from incremental changes caused by other past, present or reasonably foreseeable actions together with the project"*.

18.3 In this regard there are two types of cumulative effect which are commonly known as "Type 1" and "Type 2" effects, respectively. These are generally defined as follows:

(1) Type 1: The combined effects resultant from the development upon a set of defined sensitive receptors, for example noise, dust and visual effects; and

(2) Type 2: The combined effects arising from another development site or sites, which individually might be insignificant, but when considered together could create a significant cumulative effect.

18.4 Type 2 effects have been considered in each of the Topic Chapters with reference to the in-combination effects of the proposed development with other potential development locations within the South of Fareham Strategic Growth Area where relevant.

18.5 Table 165 considers the combined residual effects on individual environmental receptors - Type 1 effects – and illustrates that none of the combined environmental effects on individual receptors are materially different. This does not highlight a receptor that will be subject to a significant adverse environmental effect as a consequence of the combined effect.

Table 165: Combined residual effects on individual rectors

ENVIRONMENTAL RECEPTOR	NATURE OF EFFECTS	COMMENTS
Human Beings	Temporary adverse construction phase effects (dust, noise, construction traffic	These are combined temporary effects which will be experienced during the construction phase. These combined effects will not extend into the operational phase, other than the change in the character of the site and views of it which is a permanent effect that will occur over the life of the project.
	Short term effect as houses are occupied during the construction phase ahead of community infrastructure provision.	
	As visual receptors, residents close to the site and users of playing pitches and routes (including public rights of way) will experience a change in view as the character of the site is altered	
Agriculture and Soils	As built development replaces agricultural land, this will have an adverse effect on agricultural resources including best and most versatile land) and soils resource	These effects are unavoidable if the development proceeds, although the mitigation measures have been identified to both protect soils resources and minimise the landscape and visual effect. The biodiversity net gain calculation illustrates a positive effect.
	This will also change the character of the landscape from countryside to built form with associated visual and landscape impacts.	

ENVIRONMENTAL RECEPTOR	NATURE OF EFFECTS	COMMENTS
	The replacement of intensive farming will create a significant opportunity to increase the number of beneficial habitats as part of the proposed development's green infrastructure.	
Landscape features such as hedgerows and trees	There will be a loss of landscape features at Harpenden Road to facilitate the access and within the site to allow routes to be constructed; this will contribute to a change in views and landscape character.	Whilst the loss of some vegetation is necessary to form the access to the development and to allow internal routes to be constructed, these are limited in nature because of the generally open character of the site and the large field pattern. Such losses have been avoided wherever possible. The green infrastructure strategy and biodiversity plan intend that landscape and habitat features which are important to the site and its surrounding have been protected through buffer areas and set-backs. New planting is also proposed to mitigate the otherwise adverse impacts on landscape features. In addition, a management regime is proposed that will provide long-term protection for the site's ecological resource.
	These landscape features also contribute to the existing habitats on site which could result in adverse impacts.	
	Longspring Wood is an Ancient Woodland and a Local Wildlife Site. There is public access to the woodland via and existing public right of way. The increase in resident population could result in increased disturbance	
Pedestrians and cyclists and road users	Such receptors (human beings) will experience slight changes in noise environment, exposure to air pollution and adverse effects of increases in traffic and delay.	These are effects that are generated from traffic arising from the proposed development. Individually, and with the respective mitigation measures, these effects have been assessed as negligible or minor adverse. In combination therefore, receptors might experience a slight adverse effect as a result increased noise, increased air pollution and increased in road traffic. But these effects are not uniform and are not concentrated in one location or one group of receptors. For example, a driver experiencing delay on the highway network will not experience increase in noise or air pollution. These effects are more likely to be experienced by pedestrians and cyclists who already experience adverse effects bit not at a level that exceeds an objective measurement standard.

19 Summary and conclusions

19.1 Hallam Land Management Limited, and St Albans School and St Albans School Woollam Trust have submitted a planning application for a mixed-use development on land at North St Albans.

19.2 The proposed development will comprise up to 1000 new homes, a care home, a local centre to provide local retail, healthcare and community facilities, areas of green infrastructure and new open space including replacement playing pitches and a sports pavilion annex. New means of access will be formed on to Harpenden Road and Sandridgebury Lane.

19.3 The proposed development is considered to constitute Schedule 2 Development under the Town and Country Planning 17.3 The proposed development is considered to constitute Schedule 2 Development under the Town and Country Planning (Environmental Impact Assessment) Regulations 2017. Accordingly, the Applicants have has undertaken an Environmental Impact Assessment (EIA) and has prepared this Environmental Statement (ES) to accompany the planning application and present the findings of this process.

19.4 The proposed development will see agricultural fields and existing playing fields developed as new housing and infrastructure. The existing playing fields will be replaced. This built development will change the character of the site and cause the urban area of St Albans to extend into the countryside. Built development could also have an effect on environmental receptors, such as habitats and protected species, trees and hedgerows and water courses. Views of the site will also change. Construction activity could also give rise to increased risk of pollution such as noise, air quality, watercourses and groundwater.

19.5 Once the development is occupied, the new houses will provide accommodation for the identified population and household growth. The mixed-use nature of the development means that community infrastructure is provided to meet some of the needs of future residents for example primary school education, healthcare, local retail and areas for recreation. The operational effect of the development will also see increases in the traffic and associated changes in noise and air quality environments, the surface water and foul water drainage regimes could also change. Views of the site will also be different as built development is enclosed by maturing landscape.

19.6 Each of the Topic Chapters with the ES has considered these potential significant environmental effects of the proposed development which are summarised in the following paragraphs.

ECOLOGY

19.7 This chapter of the ES has been prepared by FPCR Environment and Design Ltd to evaluate the effects of the proposed development on the ecology and biodiversity assets within the site and as necessary its surroundings.

19.8 The site has been assessed as beyond the zone of influence for the Chilterns Beechwood SAC, therefore not considered that the impact this internationally designated site is negligible.

19.9 A total of nine local wildlife sites are located within a 1km radius of the site, with the Longspring Wood LWS located along the southern extent of the site. The local wildlife sites are mainly located over 0.5km from the site, with the majority of them supporting features such as designated footpaths, dog poo bins and car parks, mitigating the recreational impacts expected from the site. Further provision of a green infrastructure hub within the proposed development, with circular walking routes, as well as amenity and recreational facilities is expected to mitigate any further impacts on these local wildlife sites, and therefore it has been assessed that there will be a negligible impact.

19.10 The location of the Longspring Wood LWS, within the site boundary, means that there is a potential for it to be negatively impacted throughout the construction and operational phases. However, as an

Ancient woodland habitat it is considered that the implementation of the statutory buffer of 15m from the proposed development and the use of dust sheets will mitigate the construction impacts on this designated site. Furthermore, there is potential to protect and enhance this woodland, through the provision a signposted way marked route, dog poo bins, wildlife information posts as well as creating further mixed scrub and woodland vegetation to increase the woodland area and minimise the recreational impact across it. These proposed measures would further be secured within a 30-year management plan, including measures to protect the existing woodland and its ground flora and ensure its resilience in the future. It is therefore considered that there will be a minor positive effect from the proposals.

19.11 The site is approximately 50ha in size, comprised of six field compartments, with the majority of them under agricultural cultivation and the remainder used for recreational purposes by the Old Albanians rugby club. These field compartments are bounded by a series of hedgerows, with four woodland compartments interspersed across the site, the most southerly of which is ancient woodland habitat, protected within the Longspring Wood LWS. Sandridgebury Lane runs between the arable fields and continued in an easterly direction.

19.12 The majority of the habitats considered to be of low intrinsic value, including arable an amenity grassland will be lost through the proposals, while woodland and the majority of the hedgerows will be retained and buffered throughout the proposals. A range of proposed habitats including woodland, hedgerows, species rich grassland, mixed scrub, SuDS and individual trees, will be created within the proposals increasing the overall diversity and availability of habitats across the site, leading to and overall positive effect for the existing habitat on site. This is reflected throughout the biodiversity net gain assessment completed for this assessment which has demonstrated that the site can achieve the statutory 10% net gain on site.

19.13 A number of protected species have been recorded as utilising the current habitats on site, including badgers, bats, birds, farmland bird assemblages and reptiles. The majority of these wildlife groups will be minimally impacted throughout the construction phase, with badgers, farmland birds and reptiles considered to be the most significantly impacted. However, due to the current low populations and activity of these species' groups recorded across the site it is considered that appropriate mitigation measures implemented for these protected species will ensure that the impacts from the construction phase are negligible.

19.14 The proposals will increase the diversity and availability of habitats across the site, which is expected to provide a range of foraging, commuting and nesting resources for the protected species identified on site. Further specific actionable mitigation measures such as creation of hibernacula, installation of bat and bird boxes will be used to enhance the suitability of these habitats for these species. It is therefore assessed that the proposals will result in a negligible to minor positive impact across the majority of these species/species groups.

19.15 Due to the loss of arable habitats, it was assessed that the farmland bird assemblages would be negatively impacted by the proposals. The incorporation of an additional area of agricultural to the north of the proposed site will further be enhanced through the creation of farmland bird plots, to be managed within the existing agricultural rotational management. It is considered that the enhancement of these existing offsite habitats, will appropriately mitigate the impact of the loss of arable habitats on site and provide more suitable habitats for theses specialist bird assemblages resulting in minor positive effect in the long term.

19.16 The assessment above has shown that with the documented appropriate mitigation measures the proposals will result in negligible and minor positive effects to the designated sites, habitats and protected species recorded throughout the assessment.

LANDSCAPE AND VISUAL

19.17 This chapter of the ES has been compiled by Define Planning & Design and concerns the likely significant environmental effects of the proposed development on the elements that make up the landscape; the specific aesthetic or perceptual qualities of the landscape; the character of the landscape; and people who will be affected by changes in views or visual amenity.

19.18 The proposed development would introduce activities and built form which will cause localised harm to landscape character and detract from the pre-existing scene experienced by those within the surrounding landscape during its construction and at the point of its completion.

19.19 Whilst the effect of these changes are assessed to be not significant for most landscape and visual receptors, the proposed development is assessed to result in a residual significant adverse effect on both the Ayres End Valleys and Ridges LCA and landscape elements of the site landscape receptors and on six visual receptors (users of public footpath St Albans City 096, users of the permissive path through the site, users of public bridleway Sandridge 009, users of Sandridgebury Lane [within the site], users of Old Albanians Rugby Club and users of Harpenden Road) during the construction phase; and on both the Ayres End Valleys and Ridges LCA and landscape elements of the site landscape receptor and on four visual receptors (users of public footpath St Albans City 096, users of the permissive path through the site, users of public bridleway Sandridge 009 and users of Sandridgebury Lane [within the site]) at the point of completion.

19.20 It is considered that the mitigation planting, inherent to the proposals, would not entirely overcome the harm caused by the proposed development to landscape character or people's visual amenity 15 years after completion. These changes are however assessed to deliver a beneficial effect (Moderate beneficial) to the landscape elements within the site receptor at this stage and to reduce the significance of adverse effect to not significant for all landscape and visual receptors other than users of public bridleway Sandridge 009; who presently overlook a predominantly farmed and wooded landscape in elevated, cross-valley and middle-distance views, and the harm upon whom it is considered could only be materially reduced through the restoration of foreground hedgerow vegetation immediately bordering this route, which is on land outside the control of the applicant.

AGRICULTURE AND SOILS

19.21 This chapter of the ES concerns the likely significant environmental effects of the proposed development on agriculture and soils. It has been compiled by Reading Agricultural Consultants Limited.

19.22 The ALC and soil surveys have classified the site as mostly Subgrade 3a quality with a smaller area of Subgrade 3b. Agricultural land of Subgrade 3a quality is within the bracket of BMV and is a resource of medium sensitivity. The loss of 40.8ha of agricultural land, of which 31.7ha is Subgrade 3a and 9.1ha is Subgrade 3b, is a medium magnitude of change.

19.23 There are no measures to mitigate the loss of agricultural land. The residual effect is a moderate adverse effect. This is significant in EIA terms.

19.24 The main soil resource comprises heavy clay loam and clay textures which is a resource of high sensitivity. With the implementation of a SRMP to mitigate the effects of the proposed development on soil resources, the residual magnitude of change is low, resulting in an overall moderate/minor adverse effect on soil resources. This is not significant in EIA terms.

HERITAGE AND ARCHAEOLOGY

19.25 This chapter of the ES concerns the likely significant environmental effects of the proposed development on archaeology and heritage assets. It has been compiled by Orion Heritage.

19.26 A review of the National Heritage List for England confirmed that there are no designated heritage assets within the main Application site. The assessment has identified the potential for previously unrecorded prehistoric to Romano-British below ground archaeological remains within the site. The significance and sensitivity of the potential archaeological resource is considered low based on the results of geophysical survey. The magnitude of change is considered direct, negative medium adverse.

19.27 The implementation of a staged programme of archaeological works will allow the identification of archaeological assets within the site and a suitable mitigation strategy to be developed and agreed with SACDC and their archaeological advisors. Mitigation responses may include preservation by record or the implementation of design responses at detailed application stage. This is considered to offset rather than reduce the overall effects on archaeology which remains at minor adverse.

19.28 The proposed travel improvements at Ancient Briton junction are considered to have a neutral effect on the nationally significant Iron Age territorial boundary known as Beech Bottom Dyke (NHLE 1019136), both in terms of construction and operation.

19.29 As assessment of potential effects to designated assets in the vicinity of the development has taken place. The assessment concludes that the designated assets within the wider vicinity of the site have low sensitivity, due to distance and intervening topography and vegetation. As such, the anticipated magnitude of change is considered negligible/ neutral (permanent). The significance of this effect is considered to be negligible.

GROUND CONDITIONS

19.30 This chapter of the ES concerns the likely significant environmental effects of the proposed development on ground conditions and the risk to future occupants of the proposed development on contamination. It has been compiled by Brookbanks Consulting Limited.

19.31 This chapter has identified that the following receptors will be affected by the proposed development: human health (i.e. existing and future Site users); controlled water (i.e. groundwater and surface water); fauna and flora and below ground services/structures. Following mitigation, the effects on each of these receptors is negligible.

WASTE AND MATERIAL ASSETS

19.32 This chapter of the ES concerns the likely significant environmental effects of the proposed development on Waste. It has been compiled by Brookbanks Consulting Limited

19.33 This chapter has identified that the following sensitive receptors will be affected by the proposed development: human health (i.e. existing and future Site users); waste treatment and recycling facilities, inert, non-hazardous and hazardous landfill sites; ground and water contamination; visual Impact of the surrounding areas. Following mitigation, the following effects on each of these receptors is considered to be negligible.

WATER RESOURCES

19.34 This chapter of the ES concerns the likely significant environmental effects of the proposed development on the environment in respect of the local hydrology, drainage and flood risk as well as surface and ground water quality as a result of the construction and operation of the proposed development. It has been compiled by PJA Civil Engineering Ltd.

19.35 This assessment of the site in relation to flood risk, drainage, groundwater and surface water quality issues has been undertaken as a desktop study in line with best practice guidance. Baseline conditions have been established using readily available information, including web-based information and a desk-based assessment.

19.36 This information has been used to identify key receptors and the associated sensitivity/value of each of these receptors, which include: (1) Unnamed Ordinary Watercourses within the site (low); (2) Groundwater Source Protection Zone 3 (medium); (3) Population & Human Health (high)

19.37 Potential impacts with respect to construction and operational phases of the proposed development on these key receptors and their effects have been identified as part of this assessment and following the inherent mitigation, as set out within this chapter, it is identified that in both the construction and operation phase, it is anticipated that there should be negligible to minor adverse effects on key receptors identified.

19.38 The assessment has demonstrated that providing the mitigation measures identified in this assessment and supporting FRA and Drainage Strategy are adhered to, the proposed development will sustainably manage the drainage of the site and flood risk (both on- and off-Site) for its lifetime, accounting for the effects of climate change.

19.39 There are residual flood risks associated with any extreme storm event and water supply. However, these have been mitigated for as far as reasonably practicable.

19.40 Therefore, the proposed development has the potential to have a minor adverse level of effect on the groundwater protection zone 3 and the Mid Chilterns Chalk WFD Waterbody, as a result of the use of PFOA during the construction of the development and the reduction of aquifer recharge due to the introduction of impermeable surfaces and absence of surface water infiltration As an individual development these minor adverse effects are considered to be not significant. A summary of the assessment is set out in the table below.

SOCIO-ECONOMICS

19.41 This chapter has been prepared by LRM Planning, the purpose of which is to provide an assessment of the likely significant effects of the proposed development on human beings, more commonly referred to as the study of socio-economic effects. Specifically, it considered the effects in terms of population, housing, education provision, healthcare provision, open space requirements, community facilities, and economic impacts.

19.42 North St Albans is a proposed allocation for mixed-use development in the emerging Local Plan for St Albans. In addition to 1,146 houses, it is allocated for a two-form entry primary school, green infrastructure, transport infrastructure, and other community infrastructure. The other community uses are to include a local centre with retail and business uses, and open space.

19.43 The proposed development will result in a minor beneficial effect during construction, with minor adverse effects for a short transitional period where residents occupy the site prior to completion of the mixed-use elements.

19.44 The delivery of 930 market and affordable dwellings, in addition to 80 care facility beds and 80 retirement living units, will have a substantial beneficial effect in terms of meeting future population and housing requirements, responding to the local identified housing needs of St Albans.

19.45 The provision of various open spaces will result in a moderate beneficial effect.

19.46 The provision of community spaces throughout the scheme, principally within the local centre, will result in minor beneficial effects.

19.47 The population growth anticipated as a result of the proposed development will result in additional demand for education and healthcare facilities. The provision of a two-form entry primary school, a healthcare surgery within the local centre, and financial contributions will result in negligible effects.

CLIMATE CHANGE

19.48 This chapter of the ES concerns the likely significant environmental effects of the proposed development in relation to Climate Change. It has been compiled by Turley Sustainability & ESG. The assessment of effects in relation to climate change have been considered in two parts; firstly the increase in greenhouse gas emissions that the proposed development will give rise to; and secondly, how the scheme mitigates or adapts to climate change.

Part 1: Greenhouse gas emissions

19.49 Construction Phase: The sensitivity of climate system is considered to be high. The magnitude of change is considered to be negligible. The proposed development's construction GHG emissions are considered to comprise current and emerging good practice and contribute to the UK's net zero trajectory. Therefore, there is likely to be a direct, temporary, long-term, adverse effect which is considered to be minor. This effect is considered to be not significant

19.50 Operations Phase The sensitivity of climate system is considered to be high. The magnitude of change is considered to be negligible. The proposed development's operational GHG emissions are considered to comprise current and emerging good practice and contribute to the UK's net zero trajectory. Therefore, there is likely to be a direct, temporary, long-term, adverse effect which is considered to be minor. This effect is considered to be not significant.

Part 2: Climate change

19.51 Construction Phase: The sensitivity of environmental receptors is considered to be low. The magnitude of change is considered to be small. Therefore, there is likely to be a direct, temporary, long-term, adverse effect which is considered to be negligible. This effect is considered to be Not Significant.

19.52 Operational Phase: The sensitivity of environmental receptors is considered to be low. The magnitude of change is considered to be moderate. Therefore, there is likely to be a direct, temporary, long-term, adverse effect which is considered to be minor. This effect is considered to be Not Significant.

TRAFFIC AND MOVEMENT

19.53 This chapter of the ES concerns the likely significant environmental effects of the traffic arising from the proposed development. It has been compiled by PJA.

19.54 The chapter assesses the effect of development related traffic on (1) severance of communities, (2) road and vehicle driver and passenger delay, (3) non-motorised user delay, (4) non-motorised user amenity, (5) fear and intimidation on and by road users and road user and pedestrian safety.

19.55 As a result of the transport strategy and proposed infrastructure improvements, the development will not result in any significant residual adverse effects on the local highway network or within the local area.

NOISE

19.56 This chapter of the ES concerns the likely significant environmental effects of the proposed development in terms of Noise and Vibration. It has been compiled by Noise Consultants Limited, part of Logika Group.

19.57 A baseline noise and vibration measurement survey was carried out to determine the prevailing baseline conditions across the site and at surrounding existing NSRs. It was established that road traffic noise from Harpenden Road to the west of the site, railway noise from the Midland Mainline railway to the east of the site and industrial noise from the south of the site constitute the prevailing environmental noise climate.

19.58 The nearest NSRs are predominantly high sensitivity residential receptors located to the north, east, south and west of the site. Additionally, one school (medium sensitivity) has been identified in the study area which has also been considered as an NSR. The proposed residential receptors and proposed school located within the proposed development site have also been considered in the assessments, where applicable.

19.59 During the construction phase, construction noise is likely to result in minor adverse effects at receptor groups C, G, I, J, M, and P. Subject to the working methods selected, a significant effect could be identified at NSR group F for very short periods of time. At all other receptor groups, the effect of construction noise is predicted to be negligible.

19.60 Construction vibration could result in a minor adverse effect at NSR group M for a short period of time during the construction of the new site access. At all other NSRs construction vibration is expected to be negligible.

19.61 In respect of operational building services noise, Environmental Sound Criteria have been proposed at the NSR groups which can be secured by condition and achieved through good acoustic design when building servicing requirements are known. The effect of building services noise is negligible at all NSRs. Sports activity noise from the proposed playing fields is negligible at all NSRs. Changes in road traffic noise off-site are predicted to be negligible on all of the assessed road links.

19.62 In general, the site is considered to be suitable for noise sensitive development. Good acoustic design measures should be implemented where practicable where residential development is close to Harpenden Road, the Midland Main Line Railway or Porters Wood Industrial Estate, or if school buildings are located in the northwest of the school parcel overlooking the playing fields.

19.63 Overall, the effect of the proposed development on the existing noise environment is not significant. The site is generally suitable for noise and vibration sensitive development with the implementation of good acoustic design measures close to Harpenden Road, the Midland Main Line Railway, playing fields and Porters Field Industrial Estate.

AIR QUALITY

19.64 This chapter of the ES describes the likely significant environmental effects of the proposed development on air quality and dust. It has been compiled by Air Quality Consultants Ltd.

19.65 The assessment has considered the impacts of the proposed development on local air quality in terms of dust and particulate matter emissions during construction and emissions from road traffic generated by the completed and occupied development. It has also identified the air quality conditions that future residents and users will experience.

19.66 The construction works have the potential to create dust. During construction it will therefore be necessary to apply a package of mitigation measures to minimise dust emissions. Appropriate measures have been recommended and, with these measures in place, it is expected that any impacts, which will be short-term, and residual effects will be 'not significant'.

19.67 Air quality conditions for future residents and users of the proposed development have been shown to be acceptable, with concentrations well below the air quality objectives throughout the site in the earliest year of occupation.

19.68 The assessment has also demonstrated that pollutant concentrations will be well below the objectives at all existing and cumulative receptors in 2028, with or without the proposed development, and that the emissions from the additional traffic generated by the proposed development will have a '*negligible impact and negligible* /'not significant' significance of effect on air quality conditions at all existing receptors along the affected local road network over the long-term.

SUMMARY

19.69 These conclusions are summarised in Table 166

Table 166: Summary of environmental effects

RECEPTOR	EFFECT
Ecology and biodiversity	
Chiltern Beechwood Special Protection Area	No effect
Longspring Wood Local Widllife Site	Minor positive
Beechbottom Dyke Local Wildlife Site	Negligible
All other Local Wildlife Sites	Negligible
Broad Leaved Woodland	Minor positive
Hedgerows	Minor positive
Badgers	Negligible minor positive
Bats	Negligible
Birds	Minor positive
Farmland assemblage	Minor positive
Reptiles	Minor positive
Landscape (after 15 years)	
Users of public footpath 096	Moderate adverse
Users of footpath (permissive)	Moderate adverse
Users of footpath 009	Moderate major adverse
Users of footpath 011	Minor moderate adverse
Sandridgebury Lane within the site	Minor adverse
Harpenden Road	Moderate adverse
Railway line	Minor moderate adverse
Old Albanian Sports Association facilities	Moderate adverse
Heartwood Forest	Minor adverse
St Albans Girls' School	Minor adverse
Jersey Farm Park Woodland	Minor adverse
Residents of Harpenden Road	Minor adverse
Residents of Childwick Green	No effect
Ayres End Valleys and Ridges LCA	Moderate adverse
Landscape within the site	Moderate beneficial
Agriculture and soils	
Agricultural land	Moderate adverse
Soils	Moderate and minor adverse
Heritage	
Non designated heritage assets	Minor moderate adverse

RECEPTOR	EFFECT
Iron Age Beech Bottom Dyke	Neutral
Ground conditions	
Human health	Negligible
Controlled water	Minor adverse
Fauna / flora	Negligible
Below ground services	Negligible
Future site users	Negligible
Water resources	
Watercourse	Negligible
Groundwater south protection zone	Long term minor adverse
Mid Chilterns Chalk water framework directive	Long term minor adverse
Population and human health	Long term minor adverse
Socio economic	
Housing	Substantial beneficial
Open space	Moderate beneficial
Community benefit	Minor beneficial
Education / health	Negligible
Waste	
Human health	Minor adverse
Waste treatment	Minor adverse
Ground contamination	Moderate adverse
Water contamination	Moderate adverse
Visual impact	Minor adverse
Climate change	
Global climate system	Minor adverse
Site structures / infrastructure	Minor adverse
End users	Minor adverse
Site habitats / species	Minor adverse
Traffic	
People at home on Harpenden Road	Minor adverse
St Albans Girls School	Minor adverse
Garden Fields	Negligible adverse
Batchwood School	Negligible adverse
Bernards Health	Negligible adverse
Dorent House	Minor adverse
PRoW	Negligible adverse

RECEPTOR	EFFECT
NCR 6	Minor adverse
Ancient Briton junction	Minor adverse
King William IV junction	Negligible adverse
Iron Age Beech Bottom Dyke	Negligible adverse
Noise	
Construction noise	Minor adverse
Construction vibration	Minor adverse
Operational building services	Negligible adverse
Operational sports facilities	Negligible adverse
Road traffic links	Negligible adverse
Air quality	
Dust / construction	Negligible adverse
Road traffic	Negligible adverse
Amenity	Negligible adverse

CONCLUSION

19.70 The assessment of the likely significant effects of the proposed development has concluded that the development can proceed without causing unacceptable impacts on either the local or wider environments. In many respects, the scheme will be beneficial.

19.71 Through appropriate mitigation measures which are either inherent within the proposed development and shown on the parameter plans, standard measures identified in the ES to be secured as part of the planning permission either by means of planning condition or planning obligation, or actionable mitigation to be secured by the applicants in conjunction with others, the environmental effects of the proposed development are minimised.

19.72 For these reasons, the Environmental Statement concludes that the measured environmental consequences of the proposed development support the granting of planning permission.

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