



Environmental Statement Addendum Volume 1 - Main Report



Quality Assurance

Quality Assurance

Site name:	Land South of Radwinter Road (East of Griffin Place), Saffron Walden
Client name:	Rosconn Strategic Land
Type of report:	Environmental Statement Addendum
Prepared by:	Caroline Rodger BSc (Hons) MSc PIEMA
Signed	
Date	August 2021 (Updated January 2022)
Reviewed by:	James Alflatt BA(Hons) DipTP MSc MRTPI PIEMA
Signed	
Date	August 2021(Updated January 2022)

A copy of the Environmental Statement Addendum and Appendices, alongside the original Environmental Statement may be viewed by prior appointment at Uttlesford District Council, Council Offices, London Road, Saffron Walden, CB11 4ER.

Paper copies of the Environmental Statement Addendum, together with the technical appendices can be purchased from Bidwells at a cost of £150.00. Alternatively, a CD containing the documents can be provided at a cost of £15 (prices are inclusive of VAT). The Updated Non-Technical Summary is available free of charge.

Comments on the Environmental Statement Addendum should be directed in writing to Uttlesford District Council at the address above.


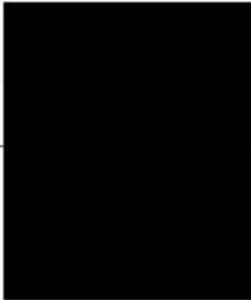



Technical Quality Assurance

Technical Quality Assurance

For each of the topic chapters included within this Environmental Statement Addendum, the relevant consultants responsible for their production have confirmed the technical robustness of the assessment process, or confirmed that no further technical assessment is required, and that the original assessment remains valid.

CHAPTER	ORGANISATION	AUTHOR	AUTHOR'S SIGNATURE
Agriculture		Mike Palmer	
Air Quality		Jo Kirk	
Ecology		Holly Smith	
Flood Risk and Drainage		Ben Fleming	
Landscape and Visual		Holly Colson	
Noise and Vibration		Mike Brownstone Andrew Moseley	
Socio-Economics and Health		David Horrock Nisha Rehm	
Transport		Chris Elliott	

CHAPTER	ORGANISATION	AUTHOR	AUTHOR'S SIGNATURE
Climate Change		Anastasia Fleming	
Major Accidents and Disasters		Laura Dugdale	

Statement of Competency

Statement of Competency

The Environmental Statement and its Addendum has been prepared by competent experts. Relevant expertise and qualifications of the expert team are outlined below.

DISCIPLINE	CONSULTANT	AUTHOR, RELEVANT QUALIFICATIONS AND EXPERTISE
EIA Coordinator and ES editor, authors of chapters not otherwise specified below.		Caroline Rodger PIEMA , 2 years' experience in EIA. James Alflatt, MRTPI PIEMA , 15 years' experience in EIA coordination, and Registered EIA Practitioner of IEMA.
Agriculture		Mike Palmer This chapter has been produced by Dr Mike Palmer, Director of Land Research Associates Ltd. Mike Palmer has over fifteen years of consultancy experience and is a professional member of the British Society of Soil Science. The chapter has been cross checked by Laura Thomas, Soil and Land Consultant of Land Research Associates Ltd. Laura Thomas has six years' consultancy experience and is working towards professional membership of the British Society of Soil Science.
Air Quality		Jo Kirk Jo has over 20 years' experience as an environmental professional with a strong technical background in the field of air quality. She has an MSc in Environmental Sciences and a BSc in Environmental Biology. She is also a member of the Institute of Air Quality Management (MIAQM) and a member of the Institute of Environmental Science (MIEnvSc). Having worked for some of the largest environmental consultancies in the UK she has gained extensive experience of managing a wide range of projects and working successfully with a broad spectrum of clients, including developers, architects, planning consultants, builders and regulatory authorities.
Ecology		Holly Smith The EcIA was prepared by Dr Holly Smith, a full member of the Chartered Institute for Ecology and Environmental Management (CIEEM) with over 15 years' professional ecological consultancy experience. Holly has prepared numerous Environmental Statements under the IEMA EIA Quality Mark. The Badger Survey was undertaken by Stuart Silver, a full member of CIEEM with over 15 years' experience and who holds a Natural England CL35 badger licence. Dormice and Bat Surveys were overseen by licenced dormice and bat ecologist, James Pattenden, who is a full member of CIEEM and who holds licences for both species.
Flood Risk and Drainage		Ben Fleming BSc (Hons) Ben has over 16 years' experience of working in the water industry and has specialised in providing flood risk and drainage advice relating to the development planning process. Career progression through this time has led to his present position as a Principal Flood Risk Consultant within the Infrastructure team based at Cotswold Transport Planning's office in Cheltenham, Gloucestershire and becoming a Chartered Member of the Chartered Institute of Water and Environmental Management (CIWEM).
Landscape and Visual		Holly Colson 2009 Chartered Member of the Landscape Institute 2005 Masters of Landscape Architecture (Newcastle University) 2003 BA (Hons) Geography (Durham University) Holly is a Chartered Member of the Landscape Institute with over fifteen years' experience in the preparation of Landscape and Visual Impact Assessments, landscape led masterplans, green infrastructure strategies and public realm design. These exercises are often undertaken to shape and assess development in the context of highly sensitive and historic natural and urban environments.

DISCIPLINE	CONSULTANT	AUTHOR, RELEVANT QUALIFICATIONS AND EXPERTISE
Noise and Vibration		<p>Resound Acoustics is a member of the Association of Noise Consultants, and all its consulting staff are full members of the Institute of Acoustics (MIOA).</p> <p>The assessment has been overseen by a director of Resound Acoustics, who has 28 years' experience in the assessment of noise and vibration impacts associated with residential development, transportation schemes, waste and power generation projects, wind farms, and construction projects, in both national and international settings. The director has given evidence at planning inquiries and appeal hearings, and at nationally significant infrastructure project examinations and holds a BEng in Engineering Acoustics and Vibration.</p> <p>The Noise and Vibration Assessment has been undertaken by an acoustic consultant with 8 years' experience in the assessment of noise and vibration impacts associated with residential development, transportation schemes, and construction projects, and holds a BSc in Music Technology and has been awarded the Institute of Acoustics' Diploma in Acoustics and Noise Control.</p>
Socio-Economics and Health		<p>David Horrocks was the Human Health lead within the combined Socio-economic and Human Health ES Chapter. David has a Master's degree in Environmental Impact Assessment and Management and is a Practitioner member of IEMA (PIEMA). David has over four years of experience in the environmental and planning sector and has previously authored Health chapters for Environmental Statements in relation to residential developments. He has also led the writing of a large scale ES for a residential development in the north west of England and has had EIA input into other similar schemes.</p> <p>Nisha Rehm was the socio-economic lead with the combined Socio-economic and Human Health ES Chapter. Nisha has a Master's degree in Environmental Management and Assessment and is a Practitioner member of Institute of Environmental Management and Assessment (PIEMA) and Full Member of the Institution of Environmental Sciences (MIEnvSc). Nisha has over 10 years' experience in the environmental sector and has previously worked on socio-economic assessments for three residential developments.</p>
Transport		<p>Chris Elliott The Transport Chapter of was prepared by Cotswold Transport Planning (CTP) whose staff have extensive experience of working on similar schemes which require Environmental Statements. The Team whom have worked on this chapter and the supporting documents include a variety of highly qualified and highly experienced staff.</p> <p>The project lead has been Chris Elliott, Regional Director with 18 years' experience in the field of transport planning. Chris is a member of the Chartered Institute of Highways and Transportation and has a BSc (Hons) degree in Human Geography from Brunel University. Chris has managed input to projects requiring Environmental Statements including Southall Gasworks (3,750 dwellings), Deptford Wharves (1,100 dwellings) and Henley Gate, Ipswich Garden Suburb (1,100 dwellings).</p>
Climate Change		<p>Anastasia Fleming is a Senior EIA Consultant within the Environment and Planning team of Tetra Tech and an Associate EIA Practitioner on the IEMA Quality Mark Register. As well as the co-ordination of EIAs and management of the technical teams, Anastasia's technical experience includes the production of Sustainability Statements / Appraisals, Climate Mitigation and Resilience Assessments, Health and Well-being and Socio-Economic Impact Assessments. Anastasia has produced Climate Change Environmental Statement Chapters for a number of projects ranging from residential through to commercial and industrial.</p>
Major Accidents and Disasters		<p>Laura Dugdale BSc, MSc, CEnv, MIEMA, Tech IOSH An Associate with WSP UK in the Environmental, Health and Safety Management and Compliance team, working on a range of Environmental and safety projects. Laura has over 10 years' experience in environmental consultancy</p>

Table of Contents

Table of Contents

1.0	Introduction	1
2.0	Methodology and Scope	7
3.0	Site and Context	11
4.0	Proposed Development including Alternatives	15
	Introduction	15
	Planning Drawings	15
	Development Overview	15
	Design Evolution	15
	Components of Proposed Development	16
	Alternatives	21
	Conclusions	23
5.0	Planning Policy	27
6.0	Agriculture	31
7.0	Air Quality	35
	Introduction	35
	Potential Impacts	35
	Methodology	35
	Existing Baseline Conditions	44
	Evolution of the Baseline Conditions without Development	46
	Predicted Impacts	46
	Evaluation of Predicted Impacts	50
	Mitigation	51
	Residual Effects	54
	Cumulative Effects	54
	Monitoring	55
	Summary of Impacts	55
8.0	Ecology	59
	Introduction	59
	Potential Impacts	59
	Methodology	60
	Existing Baseline Conditions	71
	Evolution of the Baseline Conditions Without Development	79
	Predicted Impacts	79

	Evaluation of Predicted Impacts.	81
	Mitigation	85
	Residual Effects	89
	Cumulative Effects	89
	Monitoring	90
	Summary of Impacts	90
9.0	Flood Risk and Drainage	99
10.0	Landscape & Visual	103
11.0	Noise and Vibration	107
	Introduction	107
	Potential Impacts	107
	Methodology	108
	Existing Baseline Conditions	111
	Evolution of the Baseline Conditions without Development	113
	Predicted Impacts	114
	Evaluation of Predicted Impacts	120
	Mitigation	121
	Residual Effects	122
	Cumulative Effects	124
	Monitoring	124
	Summary of Impacts	125
12.0	Socio-Economics and Health	131
	Introduction	131
	Potential Impacts	131
	Methodology	131
	Existing Baseline Conditions	135
	Evolution of the Baseline Conditions without Development	145
	Predicted Impacts	146
	Evaluation of Predicted Impacts	149
	Mitigation	151
	Residual Effects	151
	Cumulative Effects	152
	Monitoring	153
13.0	Transport	157

14.0	Climate Change	161
	Introduction	161
	Potential Impacts	161
	Methodology – Legislations and Policies	162
	SECTION 1: CLIMATE CHANGE MITIGATION	168
	Existing Baseline Conditions	171
	Evolution of the Baseline Conditions without Development	174
	Predicted Impacts	176
	Additional Mitigation, Compensation and Enhancement Measures	177
	Residual Effects	178
	Cumulative Impacts	178
	Monitoring	179
	Summary of Impacts	179
	SECTION 2: CLIMATE CHANGE ADAPTATION	179
	Existing Baseline Conditions	182
	Evolution of the Baseline Conditions without Development	182
	Evaluation of Predicted Impacts	186
	Additional Mitigation, Compensation and Enhancement Measures	189
	Residual Effects	189
	Summary of Impacts	189
15.0	Major Accidents and Disasters	195
	Introduction	195
	Methodology	197
	Existing Baseline Conditions	222
	Evolution of the Baseline Conditions without Development	222
	Predicted Impacts	222
	Evaluation of Predicted Impacts	222
	Mitigation	222
	Residual Effects	222
	Cumulative Effects	222
16.0	Cumulative Effects	225
	Introduction	225
	Methodology	225
	Results	226
	Predicted Cumulative Effects – Inter-Project Effects	228
	Predicted Cumulative Effects – Intra Project Effects	231
	Conclusions	234

17.0	Conclusions	237
	Introduction	237
	Climate Change	248
	Major Accidents & Disasters	249
	Summary of Mitigation Measures and Residual Effects	249
	Concluding Remarks	260
18.0	References	262

List of Appendices

List of Appendices

Chapter 1: Introduction

Appendix 1.1A	Council's Scoping Opinion
Appendix 1.2A	Conservation Advice

Chapter 7: Air Quality

Appendix 7.5A	Air Quality Technical Note - Assessment of Impacts with No Link Road
Appendix 7.6A	Environmental Health Officer Response

Chapter 8: Ecology

Appendix 8.6A	Breeding Bird Survey
Appendix 8.7A	Hazel Dormice Report
Appendix 8.8A	Date, Weather Conditions & Timing of Bat Static Recorded Survey

Chapter 11: Noise and Vibration

Appendix 11.2A	Assessment Policy, Standards and Guidelines
----------------	---

Chapter 13: Transport

Appendix 13.2A	Technical Note - Transport Assessment Updates
----------------	---

Chapter 14: Climate Change

Appendix 14.1A	Energy Efficiency Feasibility Assessment
----------------	--

List of Abbreviations

List of Abbreviations/Glossary

ADMS	Atmospheric Dispersion Modelling System
Ancient woodland	An area that has been wooded continuously since at least 1600 AD
Anglian Water	The water and sewerage company serving the North West of England. United Utilities are also a flood risk management authority.
Annual Exceedance Probability (AEP)	The probability, expressed as a %, of a flood event occurring in any year. A large flood which may be calculated to have a 1% chance of occurring in any one year is described as 1% AEP.
AQAL	Air Quality Assessment Level
AQC	Air Quality Consultants Ltd
AQMA	Air Quality Management Area
Aquifer	A layer of rock beneath the ground which is permeable and holds groundwater.
Asset	Flood risk assets are structures which are used to manage flood risk e.g., defences such as walls and embankments, pumping stations, culverts, trash screens, flood gates, and channels. Operating our assets means activities like closing flood gates, operating pumps, closing barriers and clearing channels and trash screens.
ATC	Automatic Traffic Count
Attenuation	The slow release of stored water or water runoff back into a surface water body or watercourse.
Avoidance	Prevention of impacts occurring, having regard to predictions about potentially negative environmental effects (e.g. project decisions about site location or design).
Baseline	The environmental or social baseline for a study comprises information gathered to understand the current or future state conditions within an identified impact area prior to implementation of a project. This is the benchmark against which impacts from subsequent development can be referenced.
BGS	BRITISH GEOLOGICAL SURVEY
Biodiversity	The biological diversity of the earth's living resources. The total variability among organisms and ecosystems. In common usage, and within these Guidelines, biodiversity is used to describe the conservation of the natural environment, rather than describing the variation within it.
BS	British Standard
Carbon emission scenarios	The basis on which global climate change models are developed that take account of different levels of global carbon emissions. The scenarios are based on complex economic models but can be simply summarised as low, medium or high emissions scenarios. It is considered highly unlikely that a low carbon emission scenario is a realistic scenario on which to base assessments.
Catchment	The total area of land, including hills, mountains and woodlands, within a drainage basin where water drains and is collected before flowing into streams, rivers, lakes and tarns.
CCG	Clinical Commissioning Group
CD	Consultation Distance
CDM	Construction Design and Management
CEMP	Construction Environment Management Plan
CIEEM	Chartered Institute for Ecology and Environmental Management
CIRIA	Construction Industry Research and Information Association
Climate	The general weather conditions prevailing over a long period of time. Climate change will see trends in the climate conditions changing (seasonal averages and extremes).

Climate Change Adaptation	The process that a receptor or project has to go through to ensure it maintains its resilience to climate change. In the case of a development project, adaptation can be embedded in the design to account for future climate conditions, or the project can introduce measures to ensure it retains its resilience (i.e. the project adapts) to future climate conditions. Environmental receptors will adapt to climate change in varying degrees depending on how vulnerable they are to climate.
Climate Change Mitigation	Measures included in a project to reduce the emissions of greenhouse gases.
Climate Change Projection	The range of possible climate conditions projected for a range of probability that the conditions will occur for a specific carbon emissions scenario
Climate Change Resilience	The resilience of something is a measure of its ability to respond to changes it experiences. If a receptor or a project has good climate change resilience, it is able to respond to the changes in climate in a way that ensures it retains much of its original function and form. A receptor or project that has poor climate change resilience will lose much of its original function or form as the climate changes.
CLOCS	Construction Logistics, Cycle Safety and Work Related Road Risk Scheme
COMAH	Control of Major Accident Hazards
Connectivity	A floodplain can only serve as a floodplain to a river if they are connected and there is no barrier between the two, for example, concrete banks to encourage a faster flow through an area. By removing barriers and improving connectivity, the river is able to flood and water and material flows and is deposited on the floodplain, as opposed to further downstream creating a flood risk elsewhere.
Convey	To transport water from one place to another e.g., by means of a river flowing.
CRTN	Calculation of Road Traffic Noise
CTMP	Construction Traffic Management Plan
CTP	Cotswold Transport Planning
Culvert	A covered channel or pipeline used to continue a watercourse or drainage path under an artificial obstruction, such as a road or railway.
Cumulative Effects	The summation of effects that result from changes caused by a development in conjunction with other past, present or reasonably foreseeable actions.
Cumulative Impact	The combined impact of a given type, from a range of different activities or sources, perhaps in conjunction with past/future development or activity. For example, the air quality impact from one development may be of low significance but the cumulative impact from several developments with individually low significance may become collectively significant
CZ	Consultation Zone
DaRT	Demand Responsive Transport
dB	Decibel
DEFRA	Department for Environment, Food and Rural Affairs
DEFRA	Department for Environment, Food & Rural Affairs
Department for Environment, Food and Rural Affairs (DEFRA)	Defra is responsible for safeguarding the natural environment, supporting the world-leading food and farm industry and sustaining a thriving rural economy. They also have overall national responsibility for policy on flood and coastal erosion risk management and provides funding for flood risk management authorities through grants to the Environment Agency and local authorities.
DMP	Dust Management Plan
DMRB	Design Manual for Roads and Bridges

Downstream	An area situated in the direction in which a river or other watercourse flows.
Drainage Basin	The total area of land drained by a river and its tributaries.
Drainage System	Drainage systems can either be natural or man-made. Natural drainage systems are all of the rivers, streams and other tributaries in a drainage basin that collect water and precipitation. Man-made drainage systems include agricultural drainage systems, and urban drainage systems which dispose domestic and industrial sewage or wastewater.
DRMB	Design Manual for Roads and Bridges
EA	Environment Agency
ECC	Essex County Council
EclA	Ecological Impact Assessment
ECOW	Ecological Clerk of Works
EFT	Emission Factor Toolkits
EIA	Environmental Impact Assessment
EIA	Environmental Impact Assessment
EIA Planning Regulations	In England and Wales these are The Town and Country Planning (Environmental Impact Assessment) Regulations 2017, plus amendments.
Environment Agency (EA)	A government body which was set up in 1996 to protect and improve the environment. They are responsible for waste management and regulating major industry, treatment of contaminated land, fisheries, water quality and resources, river, estuary and harbour navigations, conservation and ecology and managing the risk of flooding.
EPUK	Environmental Protection UK
Erosion	Where soil, sand and rock is gradually worn away by the action of rain, rivers, wind or waves.
ES	Environmental Statement
EU	European Union
EV	Electric Vehicle
FFL	Finished Floor Level
FIT	Fields in Trust
Flash Flooding	Flooding that happens very suddenly, usually due to heavy rainfall or a storm.
Flood	The temporary overflowing of water on to an area of land which is usually dry.
Flood Defence	A structure or system of structures built to reduce the risk of flooding from rivers or the sea.
Flood Peak	The largest discharge of water during a flood at a certain point in a river. Also known as peak discharge.
Flood Resilience	A community's or an individual's ability to prepare for and recover quickly from flooding.
Flood Resistance	Physical measures put in place that aim to prevent flood water entering a property.
Flood Risk	Determined by the frequency or likelihood of a flood event happening, and the consequences of the flood if it did occur.
Flood Risk Assessment (FRA)	This is an assessment which includes the flood risk to an area from varying sources of flooding, along with the identification of flood mitigation measures and advice on what courses of action to take both before and during a flood event.
Flood Zones	These zones signify the probability of river or sea flooding in a particular area. The probability values ignore the presence of any flooding or sea defences.
Floodplain	The area of land directly adjacent to a river which experiences flooding during periods of high discharge and is made up of deposited sediments from a river during a flood.
Fluvial Flooding	This means river flooding and is when a river overtops and overflows as a result of sustained or intense rainfall.

Environmental Statement Addendum Vol 1 Main Report

FORS	Fleet Operation Recognition Scheme
FRA	Flood Risk Assessment
Geomorphology	Processes of erosion, deposition and sediment transport that influence the physical form of a river and its floodplain.
GLVIA	Guidelines for Landscape and Visual Impact Assessment
GP	General Practitioner
Greenfield	An undeveloped plot of land.
Groundwater	Water found beneath the ground, stored in the cracks and gaps in soil, sand and rock, and in aquifers.
Habitat	The place or type of site where an organism or population naturally occurs. Often used in the wider sense referring to major assemblages of plants and animals found together.
HDV	Heavy Duty Vehicle
HGV	Heavy Goods Vehicle
HIA	Health Impact Assessment
HSE	Health and Safety Executive
HSI	Habitat Suitability Index
HUDU	Healthy Urban Development Unit
IAQM	Institute of Air Quality Management
IAQM	Institute of Air Quality Management
IEMA	Institute of Environmental Management and Assessment
Infiltration	This is the process in which water at the ground surface enters the soil in to the subsurface.
INNS	Invasive Non-Native Species
IP	Intermediate Pressure
ISO	International Standards Organization
km	Kilometres
Lead Local Flood Authority (LLFA)	This will be either the District Council, provided it is a Unitary Authority, or the County Council. LLFAs are responsible for developing, maintaining and applying a strategy for local flood risk management in their areas and for maintaining a register of flood risk assets. They also have lead responsibility for managing the risk of flooding from surface water, groundwater and ordinary watercourses.
LEMP	Landscape and Ecological Management Plan.
LIA	Local Impact Area
LLFA	Lead Local Flood Authority
LOAEL	Lowest Observed Adverse Effect Level
Local Flood Risk Management Strategy	Under the Flood and Water Management Act 2010, the Lead Local Flood Authority (LLFA) is required to produce a Local Flood Risk Management Strategy. It is a high level, statutory document which sets out the LLFA's approach to reducing the impacts of local flooding across the authority's area. It also promotes greater partnership working arrangements between those organisations with a responsibility for managing local flood risk and provides a strategic framework within which the various 'Risk Management Authorities' must work.

Environmental Statement Addendum Vol 1 Main Report

Local Planning Authority (LPA)	The public authority whose duty it is to carry out specific planning functions for a particular area. All references to local planning authority apply to the district council, London borough council, county council, Broads Authority, National Park Authority and the Greater London Authority, to the extent appropriate to their responsibilities.
Local Planning Authority (LPA)	This is usually the planning department of the District Council (provided it is a Unitary Authority) or the County Council for your area. They are responsible for deciding whether or not a residential or commercial development can go ahead.
LSOA	Lower-Layer Super Output Areas
LVIA	Landscape and Visual Impact Assessment
LWS	Local Wildlife Site
LWS	Local Wildlife Sites (LWS)
m	Metres
MA&D	Major Accidents and Disasters
MAH	Major Accident Hazard
Main river	Usually, larger rivers and streams that are designated as a 'main river' on the Environment Agency's Main River Map. The Environment Agency carry out maintenance, improvement and construction work on these main rivers to manage flood risk.
mAOD	Metres Above Ordnance Datum
mbgl	Metres Below Ground Level
Mitigation	Any process, activity or thing designed to avoid, reduce or remedy adverse environmental impacts likely to be caused by a development project.
mm	Millimetres
MOD	Ministry of Defence
National Planning Policy Framework (NPPF)	Provided by the government to make the planning system more accessible and less complex by reducing and simplifying the policy pages about planning. It is a guide for local planning authorities and decision makers for drawing up plans and making decisions about planning applications.
NHS	National Health Service
NO ₂	Nitrogen Dioxide
NO ₂	Nitrogen Dioxide
NO _x	Nitrogen Oxides
NPPF	National Planning Policy Framework
NPPF	National Planning Policy Framework
Offline storage	The water within the channel is diverted using an intake structure and stored in a separate area. The water is then released back into the river or to another watercourse using an outlet structure. The separate storage area may be in the form of a reservoir and is usually situated on the floodplain.
Online Storage	This is the temporary storage of water within the river channel and its flood plain. The water may be held back by an impoundment structure and slowly released by a flow control structure. A spillway may also be used to slowly release larger volumes of flood water.
ONS	Office for National Statistics
Ordinary Watercourse	These include watercourses such as rivers, brooks, becks, ditches, streams and culverts. The Lead Local Flood Authority or the Internal Drainage Board are responsible for flood risk and flood defence works on these watercourses.

OS	Ordnance Survey
PBA	Peter Brett Associates
PCU	Passenger Car Unit
Permeable	Type of ground or material that allows water to pass through it.
PFR	Potential Roosting Features
PHE	Public Health England
PIC	Personal Injury Collision
Pinch Points	The narrowing of a river channel caused by an accumulation of silt.
Planning Practice Guidance (PPG)	This was published by the Government in March 2016. The aim of it is to ensure that “the planning system allows land to be used for new homes and jobs, whilst protecting valuable natural and historic environment.” Over 7000 pages of planning guidance used to be in separate documents, and it is now on one single hard copy, online and it should be read alongside the National Planning Practice Guidance.
Pluvial Flooding	Also known as surface water flooding, this type of flooding occurs when there is intense rainfall which saturates the ground and drainage systems, and excess water cannot be absorbed.
PM	Particulate Matter
PM10	Particulate Matter < 10µm
Pollutant	A substance that is bad or harmful to the environment it is in.
PPG	Planning Practice Guidance
PPG	Planning Practice Guidance
PPV	Peak Particle Velocity
Projection	A possible outcome defined by modelling of climate variables to give a possible outcome. This is in contrast to a prediction which is a statement of probable change.
PRoW	Public Right of Way
PSZ	Public Safety Zone
RAMS	Reasonable Avoidance Method Statement
Reservoir	Large, impounded waterbody.
Riparian	The area related to or at the edge of a river.
Riparian Owner	Somebody who has a watercourse, such as a river, stream or beck, which runs through, under or alongside the boundary of their property. They are responsible for maintaining the bed and banks of the watercourse, which is on their property. Also known as a ‘watercourse owner’.
Riverbed	The bottom of a river channel which the river flows over.
RM	Reserved Matters
Runoff	The excess water that the land cannot absorb which flows over the surface or via through flow into rivers and streams etc. Runoff can be produced from both natural processes and human activity.
s	Seconds
SAC	Special Area of Conservation
SFRA	Strategic Flood Risk Assessment
SFRA	Strategic Flood Risk Assessment
Site of Special Scientific Interest (SSSI)	Areas protected by law to conserve their geology or wildlife. If land has been identified as an SSSI, you will be required to gain consent from Natural England before carrying out certain activities. They can be used in neighbourhood planning to decide whether areas in a particular neighbourhood are suitable for development.
SOAEL	Significant Observed Adverse Effect Level

Soil compaction	When soil is pressed together tightly from animals and machinery and cannot let air and water through.
SPA	Special Protection Area
SPZ	Source Protection Zones
SSSI	Sites of Special Scientific Interest
Standard of protection	The minimum height or amount of time a measure or equipment has to serve its purpose before failing.
Strategic Flood Risk Assessment (SFRA)	An assessment of flood risk in an area and the risks to and from neighbouring areas. It is used to aid in supporting and helping with planning decisions.
SuDS	Sustainable Drainage System
Surface water	This is water that falls as rain and collects on the ground surface, before flowing into drains and gullies or percolating into the ground below.
Sustainable drainage systems (SuDS)	These mimic natural drainage patterns to manage rainfall and surface water runoff close to the source. They manage the transport of water and the speed that it runs off hard surfaces before it enters watercourses. They can be designed to store water and control its infiltration into the ground to allow for evaporation and transpiration.
TA	Transport Assessment
TEMPro	Trip End Model Presentation Program
Terminology	Explanation
TN	Target Notes
Topography	The surface profile of landforms and features.
TP	Travel Plan
TRICS	Trip Rate Information Computer System
TRL	Transport Research Laboratory
UDC	Uttlesford District Council
UK	United Kingdom
UKCP09	UK Climate Projections 2009 is the suite of climate change projections produced by the UK Met Office Hadley centre, funded by Defra. Projections are broken down to a regional level across the UK and are shown in probabilistic form – illustrating the potential range of changes and the level of confidence in each projection. These have recently been superseded by UKCP18, but were previously in use for many years.
UKCP18	The most recent climate projections produced by the UK Met Office Hadley Centre, these represent an update from the UKCP09 projections. The new projections use Representative Concentration Pathways (RCPs) rather than the previous 'low, medium, high' emission scenarios. Most of the UKCP18 data outputs were published in late 2018. The detailed 2.2km resolution projections will be available in late 2019.
Unitary Authority	One level of local government in some large towns, cities or small counties which provide all local services for the area. They act as the lead local flood authorities (LLFA) and are responsible for managing the risk of flooding from surface water, groundwater and ordinary watercourses in that area.

Environmental Statement Addendum Vol 1 Main Report

Vulnerability to climate change	The inverse of climate resilience, vulnerability to climate change refers to an aspect of infrastructure, operations or a project which is susceptible to impacts arising from climate change, e.g. a building may be vulnerable to overheating due to future increases in temperature if it has not been designed with consideration of higher temperatures.
Watercourse	This includes all rivers, streams, ditches, drains, culverts, dikes, etc. through which water flows.
Watercourse owner	A watercourse owner owns the stretch of a particular water course, such as a river or stream etc, which either runs on or under your land or on the boundary of your land, up to the rivers centre. Also known as a 'riparian owner'.
Weather	Weather is what we experience on a daily basis. It is defined by the atmospheric conditions (such as temperature, wind, cloud cover, rain) prevailing at specific moments in time, or over short time periods.
WHO	World Health Organisation
WIA	Wider Impact Area
ZTV	Zone of Theoretical Visibility

Introduction



1.0 Introduction

- 1.1 Bidwells LLP have been instructed by Rosconn Strategic Land (thereafter referred to as 'the Applicant') to undertake an Environmental Impact Assessment (EIA) under the Town and Country Planning (Environmental Impact Assessment) Regulations 2017 (as amended) (hereafter 'the EIA Regulations') to accompany an outline planning application to Uttlesford District Council (UDC) ('the Council') for residential development on Land South of Radwinter Road (East of Griffin Place), Saffron Walden.
- 1.2 The Environmental Statement (ES) was prepared to support an outline application for the erection of up to 233 residential dwellings including affordable housing, with public open space, landscaping and sustainable drainage system (SuDS) providing a vehicular access point from Radwinter Road.
- 1.3 The application was accompanied by an ES which reported the findings of the extensive EIA process undertaken in advance of submission of the planning application in August 2021 ('the Original ES').
- 1.4 The application was received by the Local Planning Authority (LPA) and subsequently validated under reference UTT/21/2509/OP on 04/08/2021.
- 1.5 Following submission of the planning application and the ES, UDC adopted their formal Scoping Opinion on the 16 September 2021 (planning reference UTT/21/1138/SO) (see **Appendix 1.1A**) which raised a number of additional aspects UDC considered should be included within the ES. Paragraph 88 of the Scoping Opinion states that:
- In view of the reasoning given by consultees and legislation it is considered necessary that the following additional impacts are included and assessed within the ES:*
- Road traffic vibration (in the operational phase)
 - Ecology
 - Heritage Impacts (to be included within the LVIA)
 - Climate Change
 - Major Accidents and Disasters
- 1.6 An assessment of operational road traffic vibration, climate change and major accidents and disasters has been undertaken and is presented within this document which is an 'Addendum' to the Original ES. With regards to heritage impacts, following the issue of the Scoping Opinion, Essex County Council Conservation Officer has since confirmed that they do not consider the proposals to result in harm to the significance of the designated heritage assets, and therefore raise no objection (see **Appendix 1.2A**). Therefore, an assessment of heritage impacts has not been included in the LVIA as part of this Addendum.
- 1.7 The Addendum also includes the following:
- Further information on Air Quality - following submission, UDC had concerns that the link road between Radwinter Road and Thaxed Road being constructed under planning applications: UTT/13/3467/OP and UTT/17/2832/OP is not completed and the Proposed Development may result in additional air quality impacts within Saffron Walden. To address these concerns, additional detailed air quality modelling has been carried out to assess the impact of the Proposed Development assuming 'no link road' scenario. This information has already been submitted to UDC for review (see **Appendix 7.5A**), and the Council's

Environmental Health Officer (EHO) has accepted its findings (see **Appendix 7.6A**). For completeness, this further environmental information is included as part of this Addendum;

- Additional ecological survey data that was not available at the time of submission of the Original ES; and
- An updated Socio-Economics Assessment to include alterations to the indicative housing mix, which is supported by the Council's Housing Officer.

1.8 The structure of the Addendum is presented in **Table 1.1A** below and indicates the level of update which has been required to each of the subsequent chapters.

1.9 **Table 1.1A Structure of Addendum**

CHAPTER TITLE	CHAPTER TITLE	ADDENDUM STATUS
1	Introduction	Updated text to be read in conjunction with chapter 1 of the August 2021 ES
2	Methodology	No amendments necessary. Chapter 2 of the August 2021 ES remains valid
3	Site Context	No amendments necessary. Chapter 3 of the August 2021 ES remains valid
4	Proposed Development and Alternatives	Replacement of ES chapter. Additions and omissions are highlighted in blue
5	Planning Policy	No amendments necessary. Chapter 5 of the August 2021 ES remains valid
6	Agriculture	No amendments necessary. Chapter 6 of the August 2021 ES remains valid
7	Air Quality	Replacement of ES Chapter. Additions and omissions are highlighted in blue
8	Ecology	Replacement of ES Chapter. Additions and omissions are highlighted in blue
9	Flood Risk and Drainage	No amendments necessary. Chapter 9 of the August 2021 ES remains valid
10	Landscape and Visual	No amendments necessary. Chapter 10 of the August ES remains valid
11	Noise and Vibration	Replacement of ES Chapter. Additions and omissions are highlighted in blue
12	Socio-Economics	Replacement of ES Chapter. Additions and omissions are highlighted in blue
13	Transport	No amendments necessary. Chapter 13 of the August 2021 ES remains valid, however, supplemented by a technical note which forms an appendix to this Addendum
14	Climate Change	New chapter included
15	Major Accidents and Disasters	New chapter included
16	Cumulative Assessment	Replacement of ES Chapter. Additions and omissions are highlighted in blue
17	Conclusions	Replacement of ES Chapter. Additions and omissions are highlighted in blue

- 1.10 As referenced in **Table 1.1A** this Addendum must be read in conjunction with the August 2021 ES which remains applicable to the scheme for which permission is sought and provides background environmental information on the proposals. Any information that has not altered from the original ES has not been included in this Addendum and, therefore, all other elements of the ES and its technical appendices dated August 2021 remain valid and unchanged.
- 1.11 The further information contained in this Addendum, has been prepared and is submitted voluntarily by the Applicant. The requirements of Regulation 25 of the EIA Regulations are being, and will be complied with, in respect of the additional information provided within this Addendum.
- 1.12 This Addendum is organised into three main components:
- Volume 1: Main Addendum Report (this document);
 - Volume 2: Technical Appendices (providing any additional or updated appendices); and
 - Volume 3: Non-Technical Summary (NTS).

Methodology and Scope



2.0 Methodology and Scope

- 2.1 No further changes required as part of this Addendum. Chapter 2 of the submitted ES, dated August 2021, remains unchanged and valid.

Site and Context



3.0 Site and Context

- 3.1 No further changes required as part of this Addendum. Chapter 3 of the submitted ES, dated August 2021, remains unchanged and valid.

Proposed Development Including Alternatives



4.0 Proposed Development including Alternatives

Introduction

- 4.1 This chapter describes the Proposed Development which forms the basis of the EIA. It describes the various elements of the proposals, as well as the means by which the proposals would be implemented.

Planning Drawings

- 4.2 Planning drawings relied on and which form the basis of the EIA are appended to the Original ES in **Appendix 4.1**.
- 4.3 The planning application is made in outline with all matters reserved with the exception of access. Therefore, to inform the EIA, a series of Parameter Plans have been prepared covering Land Use, Building Heights, Access and Movement and Green Infrastructure.
- 4.4 Together, these Parameter Plans define:
- The location for the principal areas of built development within the overall Site boundary;
 - The height of the Proposed Development;
 - The overall extent of land which may be used for open space, landscaping, surface water storage and other 'Green Infrastructure'; and
 - The principal routes of movement for vehicular and non-vehicular traffic.

Development Overview

- 4.5 The application will be submitted in outline, with all matters reserved for future approval, with the exception of access.
- 4.6 The full description of development is:
- Outline planning application for the erection of up to 233 residential dwellings including affordable housing, with public open space, landscaping and sustainable drainage system (SuDS) with vehicular access point from Radwinter Road. All matters reserved except for means of access.*

Design Evolution

- 4.7 Twelve design principles have been formulated in order to evolve the most appropriate design strategy for the Site. A summary of these are provided below:
- 1) Reflect local landscape character by creating similar field patterns marked by narrow woodland shaws for development to nestle into;
 - 2) Woodland blocks on or around ridgelines will be included to provide screening;
 - 3) Open ground on higher land to the south east will be created to protect views to the town and countryside/view corridors towards local landmarks such as St Mary's Church;
 - 4) SuDS features will be included to mark the entrance of the Site at its lowest point with potential reference to historical local landscape features, such as moats;
 - 5) The relationship between movement corridors and landform will be maintained as well as development edges and landform;

- 6) The eastern parcel of the Site will be well integrated into the landscape to provide a sensitive transition to rural areas;
- 7) Tertiary streets will reflect character and create a place for people first;
- 8) The built form will reflect local vernacular;
- 9) Green and blue infrastructure will reinforce/enhance biodiversity and habitat creation;
- 10) Amenity value and use of spaces will be included within green and blue infrastructure networks;
- 11) Urban grain and density will reflect local context and character with particular care taken to sensitive edges such as the eastern edge; and
- 12) An extensive network of pedestrian/ cycle connection will be included to maximise permeability, connectivity and opportunities for active travel rather than vehicular use.

4.8 Following consultation with UDC and ECC, the design principles have evolved to create the following Masterplan, as shown in **Figure 4.1A**.

Components of Proposed Development

Use and Amount

4.9 Outline planning consent is sought for up to 233 residential dwellings. The Land Use Parameter Plan (**Appendix 4.1**) shows that the proposed green and open space across the Site will provide a number of functions and activities, including play and recreational activity. The majority of existing hedgerows and trees will be retained, thereby maintaining connectivity to preserve and enhance ecological habitats.

Density

4.10 The Proposed Development seeks to make efficient, effective use of the land and offers a design which has been influenced by its location and the character of the surrounding context, comprising of up to 233 dwellings which equates to an average residential density of circa 35 dwellings per net developable hectare.

4.11 The specific mix of dwellings will be agreed through future reserved matters applications. The Proposed Development will provide a range of unit types in terms of size, ranging from 1/2 bedroom flats, 2-bedroom units and up to 4 5 bedroom homes. An indicative housing mix is provided in **Table 4.1A**, which is supported by the Council's Housing Officer.

Table 4.1A: Indicative Housing Mix

HOUSE TYPE AND NUMBER OF BEDS	APPROXIMATE NUMBER
1 bed flat	34 15
2 bed flat	36 12
2 bed house	73 38
3 bed house	78 93
4 bed house	24 54
5 bed house	21



Landscape

- 4.13 The landscape strategy for the Site, as informed by the design principles mentioned above, has been driven by the Site's existing key views in and out of the Site and to enhance connections into the wider existing community. A network of multi-functional Green Infrastructure will protect and enhance existing hedgerows and trees, provide new biodiverse habitats, incorporate sustainable drainage attenuation and provide areas for play and recreation.

Health and Wellbeing

- 4.14 The landscape strategy focuses on the health and wellbeing of future residents and future users of the key spaces of the Site.

Social and Play.

- 4.15 A number of social civic opportunities have been created within the design for the key spaces that provide the means for community events or small pop-up social events. In addition, two formal play spaces (LEAPS) are proposed.

Recreation

- 4.16 The proposed Green Infrastructure will provide a connected movement network for pedestrians and cyclists linking the Proposed Development to Saffron Walden and existing PRowWs through the outlying countryside. The network will also link key spaces within the Site, providing convenient access to a variety of functions and activities and a circular loop around the Proposed Development.

Green Infrastructure Network

- 4.17 The collective vision for the Masterplan is to establish a sustainable landscape through a strong Green Infrastructure network which sensitively integrates and enhances the existing Green Infrastructure and promotes the creation of new green infrastructure into the design.

- 4.18 A series of linked key spaces will be formed on the Site as a network. These spaces include:

High Land Park

- 4.19 High Land Park will be a multifunctional space on higher land at the south east of the Site with expansive views to Saffron Walden. The space proposes to incorporate meadowland, a viewing area with seating and native planting/woodland blocks.

Green Corridors

- 4.20 The Green Corridors are internal linear open spaces that follow the landform falling from the High Land Park to the south/east to the wetland area to the north of the Site. The Green Corridors will contain a mixture of functional open space areas as well as semi-natural areas.

Church Corridor

- 4.21 The Church Corridor is a green street and view corridor that frames the view from the Site to St Mary's Church. The Corridor connects the High Land Park to the Western Neighbourhood Green.
- 4.22 A wide verge with tree planting, pedestrian and cycle connections are accommodated within the Church Corridor.

Wetland Edge

- 4.23 The wetland edge will front directly onto a large naturalistic space to the north of the Site. This combines swathes of meadow, native planting, existing hedgerows and wetlands to create an ecologically diverse space.

Rural Edge

- 4.24 The Rural Edge will wrap around the north east and south east of the Site and will incorporate a variety of landscape types including existing densely wooded edges.

Drainage Strategy

- 4.25 The proposed Drainage Strategy for the Site is an integral part of the Green Infrastructure design and aims to work with the existing topographical features and control surface water runoff from the Proposed Development through the use of SuDS, such as open channel swales and basins.

Open Space

- 4.26 As shown on the Landscaping and Green Infrastructure Parameter Plan (**Appendix 4.1**), the Proposed Development will create a total of 10.09ha of green space as shown in **Table 4.2A**.

Table 4.2A: Open Space Provision

OPEN SPACE CATEGORY	SITE PROVISION (HA)
Parks and Gardens *	0.59
Natural/ Semi Natural Green Space	1.66
Amenity Green Space	1.02
Hybrid Green Space**	6.82
Total	10.09

*Including provision for Children and Young People

** Natural/semi Natural Amenity

Access

- 4.27 As shown on the Access and Movement Parameter Plan (**Appendix 4.1**), provision of a hierarchy of new primary, secondary, tertiary, pedestrian and cycle routes are proposed, allowing users of the Site to move safely between different parts of the Site as well as to the adjacent countryside, services and facilities of Saffron Walden.
- 4.28 Primary vehicular access will be provided from a new access on Radwinter Road. The alignment of the Primary Route and the space made available for its junction arrangements are such that the route and its junction could, if required, be made available in future and subject to further works, to accommodate a future relief road to development to the south (more detail on this is provided in the assessment of alternatives, later in this chapter).
- 4.29 The public transport strategy for the Proposed Development includes provision for bus stops on Radwinter Road. The primary route has been designed to accommodate bus movements and allows the potential for bus services to enter the Site, if required in the future.

Sustainability

- 4.30 The Proposed Development is anticipated to incorporate energy design measures to reduce energy demand and, therefore CO₂ emissions, during both its construction and operation.

Construction .

- 4.31 A CEMP will be prepared by the appointed contractor which will implement Good construction practices and the likely measures will include:

- Materials will be selected with lower transport-related carbon emissions and, therefore, sourced locally, wherever practical;
- Deliveries during peak hours will be avoided;
- Regular vehicle maintenance;
- When not required, lights and any other energy-consuming equipment will be switched off; and
- Tools, equipment and construction plant used on-site will be well maintained and kept in good working order.

Design and Operations

- 4.32 The proposed building envelope of the new residential dwellings will be designed in accordance with the standards of the most up to date Building Regulation Part L. This will be achieved through the implementation of the energy hierarchy:

- Be Lean (minimise energy use);
- Be Clean (provide energy efficiently); and
- Be Green (use low and zero carbon energy technologies).

- 4.33 The exact measures that will be used in the Proposed Development will be outlined during the reserved matters of the scheme, during which the exact percentage of carbon reductions will be calculated against the most up to date Building Regulations. However, some of the options that will be considered within any energy reduction strategies are set out below:

- **Natural Daylighting** - the proportions and distribution of glazing within dwellings are expected to ensure good levels of daylight, helping to reduce electricity consumption through artificial lighting;
- **Natural Ventilation** - the scheme will be designed and built to minimise the risk of summer overheating without the use of comfort cooling via natural ventilation, solar controlled glazing and effective external shading;
- **Energy Efficient Appliances** - where provided, white goods and kitchen equipment are to be energy efficient:
 - Minimum of A+rating for fridges and freezers or fridge-freezers;
 - Minimum of A rating for washing machines and dishwashers; and
 - Minimum of A rating for washer-dryers or tumble dryers.
- **Energy Management Systems** - such as smart meters will be installed in all dwellings to enable residents to monitor their energy usage and provide an aid to reduce energy consumption;

- **Energy Efficient Lighting** - Each dwelling will be fitted with 100% energy efficient LED light fittings to reduce energy consumption. Where external lighting is provided, this will also include photocells to control for the presence of daylighting and/or Passive infrared (PIR) presence detection, where appropriate;
- **Heat Absorption** - Cool, light coloured building materials will be considered, where appropriate, to optimise the reflection of light and minimise heat absorption while avoiding glare and addressing potential urban heat island effects;
- **Water** - conservation measures such as rainwater harvesting, greywater recycling and water metering technologies, including Low flush toilets, flow regulated spray taps and shower heads and A Rated Water efficient appliance – would minimise water consumption to 110 litre per person per day;
- **Waste** – During the Proposed Development there will be a provision of waste recycling to divert waste from landfill;
- **Sustainable Travel** - The Site is supported by good transport links with easy walking distance to the facilities proposed on-site. To encourage walking and cycling, the Site landscaping and infrastructure was designed with sustainable transport considerations in mind, including segregated routes, dedicated cycle routes, pedestrian bridge and riverside paths; and
- **Electric Vehicle Charging** - the Proposed Development will provide an electric car charging supply point to the garage or parking space adjoining each private dwelling.

Alternatives

- 4.34 Schedule 4 of the EIA Regulations requires that an ES should provide a description of reasonable alternatives considered by the Applicant which are relevant to the project and its specific characteristics, and an indication of the main reasons for the chosen option including a comparison of environmental effects. This is provided below.

Site Alternatives

- 4.35 No alternative sites were considered by the Applicant. The Applicant has other landholdings in the area, however, these sites were not considered suitable for development as these are not well related to existing settlements and are not sustainably located.
- 4.36 The Site selected is adjacent to the existing built up area of Saffron Walden, which is a well-served Town, and considered a sustainable location for further development.
- 4.37 The 'No Development' alternative, or evolution of the Site without the Proposed Development is considered in each topic chapter, embedded within establishing the existing baseline environmental conditions, as required under the 2017 EIA Regulations (Schedule 4,3).

Design Alternatives – Relief Road Alignment

- 4.38 During consultation with UDC and ECC in March 2021, discussions were undertaken to assess the potential for the future alignment of a relief road through the Site. Two different options for the relief road have been tested by the design team: a relief road in the western extent of the Site or in the eastern extent of the Site. The capacity of each alignment to accommodate new traffic would be the same, as confirmed in the Transport Assessment (**Appendix 13.1**).

- 4.39 Following detailed technical analysis, the western alignment has been selected. In addition to highways reasons, there are a variety of non-transport related reasons why the western option is considered to be more appropriate, including landscaping and visual impact, utilities and arboriculture. This is detailed in the sections below.

Highways

- 4.40 There are a number of constraints associated with an eastern alignment in relation to the positioning of the new junction on Radwinter Road. The Applicant does not own or control any land immediately to the east of the Site fronting Radwinter Road, therefore, the position of a roundabout would require land under the Applicant's control and/or existing adopted highway in order to satisfy forward visibility requirements associated with the junction.
- 4.41 The horizontal alignment of Radwinter Road at the eastern end of the Site is challenging with a level difference of between 4-5m between Radwinter Road and the Site. Substantial earthworks and a significant realignment of Radwinter Road would be required to deliver a roundabout junction that complies with the relevant design standards in this location.
- 4.42 The extent of the realignment and earthworks would result in a substantial amount of dense boundary vegetation (including mature trees) being removed to accommodate the junction and its forward visibility arrangements. The junction would also impact on the existing watercourse on this boundary requiring a culvert under the new link road and, as a result of the removal of vegetation and alterations to the watercourse, this option would result in additional ecological impacts.

Utilities

- 4.43 There are a number of key constraints in relation to existing utilities that have been identified in relation to an eastern alignment relief road that would not be a consideration with the proposed western alignment relief road corridor. These include an active oil pipeline that would need to be re-routed due to its depth, the likely required gradient of the road and the topography in this area. This would be prohibitively difficult given the pipeline serves key infrastructure, including airports.

Arboriculture

- 4.44 To facilitate the eastern relief road alignment and its junction arrangements with Radwinter Road and associated earthworks, approximately 160m of roadside mature boundary vegetation would need to be removed. A roadside copse of ash trees with would also be removed resulting in the removal of approximately 500m² of scrub woodland habitat.
- 4.45 The proposed western relief road corridor would require removal of approximately 113m of the existing established hedgerow on the southern side of Radwinter Road. Pruning back of the remaining hedgerow either side will be needed to provide the required visibility splays. The wetland area to the immediate south of Radwinter Road where the junction is proposed provides ample space for new planting to mitigate the loss of vegetation.

Landscape and Visual Impact

- 4.46 The positioning of a new junction on Radwinter Road at the eastern end of the Site to form access to a relief road would significantly alter the landscape character in this location. At present, Radwinter Road has the feel of a rural road, beyond the urban extent of Saffron Walden forming part of the rural gap between Saffron Walden and Swards End. A new junction in this location would not only result in ecological and arboricultural impacts but will also have

a significant impact on the current landscape character as this would in effect remove the special elements that contribute to its character. The urbanising effect of a new junction in this location, as well as the onward alignment of the relief road, would in effect, result in a more urbanised eastern edge to Saffron Walden which, in turn, could be regarded as contributing to the coalescence of Saffron Walden with Swards End. Furthermore, the presence of the relief road alignment to the east would, whilst encircling development to the immediate west on the Site, give rise to development pressure on land to the immediate east of the alignment too. If development did occur here then there is a realistic prospect that the development edges of Saffron Walden and Swards End would meet.

Conclusions

- 4.47 It has been demonstrated in this chapter, that the proposals have been developed and evolved in response to the technical assessments undertaken by the consultant team and included within this ES, but also through engagement with Council Officers and statutory consultees and the public in order to deliver the Proposed Development. The Applicant and its design team consider this to be the most appropriate solution after having regard to those environmental assessments and engagement with stakeholders to provide the best quality solution for the Proposed Development.
- 4.48 The next chapter of this ES sets out the planning policy context, insofar as it relates to the Proposed Development.

Planning Policy

5

5.0 Planning Policy

- 5.1 No further changes required as part of this Addendum. Chapter 5 of the submitted ES, dated August 2021, remains unchanged and valid.

Agriculture

6

6.0 Agriculture

- 6.1 No further changes required as part of this Addendum. Chapter 6 of the submitted ES, dated August 2021, remains unchanged and valid.

Air Quality



7.0 Air Quality

Introduction

7.1 This chapter addresses the air quality impacts of the Proposed Development and has been prepared by Kairus Ltd.

7.2 This chapter is supported by the following appendices:

- Appendix 7.1: Air Quality Technical Report;
- Appendix 7.2: Locations of Receptors used in Modelling;
- Appendix 7.3: Location of Saffron Walden AQMA and Monitoring Sites; [and](#)
- Appendix 7.4: Results of Air Quality Dispersion Modelling; [and](#)
- [Appendix 7.5A: Air Quality Technical Note- Assessment of Impacts with No Link Road.](#)
- [Appendix 7.6A: Environmental Health Officer Response, dated 14 December 2021](#)

Potential Impacts

7.3 The assessment has considered the following potential impacts:

- Nuisance and health impacts as a result of dust and PM₁₀ emissions during the construction phase;
- Impacts on existing human receptors as a result of construction traffic related emissions of NO₂ and particulates (PM₁₀ and PM_{2.5});
- Impacts on existing human receptors as a result of operational traffic related emissions of NO₂ and particulate matter; and
- Impacts in relation to new exposure through the introduction of new residential receptors to the Site.

7.4 In addition to the above, an additional assessment has been carried out to consider the impact of the development on local air quality at existing human receptors should the new link road between Radwinter Road to the north and Thaxted Road to the south no be completed.

Methodology

Legislative Framework and Guidance

7.5 The following legislation and national/local policy has informed the assessment of effects within this chapter, and is detailed further in the Air Quality Technical Report provided in **Appendix 7.1 of the original ES.**

- EU Directive 2008/50/EC of the European Parliament and of the Council; of 21 May 2008 on ambient air quality and cleaner air for Europe;
- Air Quality Regulations 2010 - Statutory Instrument 2010 No.1001;
- The Air Quality Strategy for England, Scotland, Wales and Northern Ireland - July 2007;
- NPPF, Ministry of Housing, Communities and Local Government, 2021;
- The Environment Act 1990, Secretary of State; and
- UDC Local Plan 2005.

7.6 The following guidance has informed the assessment of effects within this chapter, and is detailed further in the Air Quality Technical Report provided in **Appendix 7.1** of the original ES.

- Local Air Quality Policy Guidance (PG16) (Defra 2016);
- Local Air Quality Technical Guidance (LAQM.TG(16)) (Defra 2016);
- Guidance on the Assessment of Dust from Demolition and Construction Version 1.1, Institute of Air Quality Management (IAQM 2014);
- Land-Use Planning & Development Control: Planning for Air Quality, Environmental Protection UK (EPUK) and IAQM (IAQM 2017); and
- Air Quality Planning Practice Guidance (Ministry of Housing, Communities & Local Government, 2014).
- UDC Interim Climate Change Planning Policy (March 2021).

Construction Phase

Construction Traffic

7.7 During construction of the Proposed Development, lorries will require access to the Site to deliver and remove materials; earthmoving plant and other mobile machinery may also work on-site including generators and cranes. These machines produce exhaust emissions; of particular concern are emissions of NO₂ and PM₁₀.

7.8 A qualitative review of potential impacts from construction traffic has been carried out with potential trip generation screened against the EPUK & IAQM air quality planning criteria.

Fugitive Dust Emissions

7.9 Construction phase activities associated with the Proposed Development may result in the generation of fugitive dust emissions (i.e. dust emissions generated by site-specific activities that disperse beyond the construction site boundaries).

7.10 If transported beyond the Site boundary, dust can have an adverse impact on local air quality. The IAQM guidance considers the potential for dust nuisance and impacts to human health and ecosystems to occur due to activities carried out during the following stages of construction:

- Demolition (removal of existing structures);
- Earthworks (soil-stripping, ground-levelling, excavation and landscaping);
- Construction (activities involved in the provision of a new structure); and
- Trackout (the transport of dust and dirt from the construction site onto the public road network where it may be deposited and then re-suspended by vehicles using the network).

7.11 A qualitative assessment of air quality impacts due to the release of fugitive dust and particulates (PM₁₀) during the construction phase was undertaken in accordance with the methodology detailed in the IAQM guidance.

7.12 The assessment takes into account the nature and scale of the activities undertaken for each source and the sensitivity of the area to an increase in dust and PM₁₀ levels, thus enabling a level of risk to be assigned. Risks are described in terms of there being a low, medium or high risk of dust impacts.

7.13 Once the level of risk has been ascertained, then site specific mitigation proportionate to the level of risk is identified, and the significance of residual effects determined.

- 7.14 A summary of the IAQM assessment methodology is provided in the Air Quality Technical Report, **Appendix 7.1 of the original ES.**

Operational Phase

Introduction

- 7.15 The prediction of traffic related emissions has been undertaken using the ADMS Roads dispersion model (Version 5.0.0.1, released March 2020, updated in September 2020). The model uses detailed information regarding traffic flows on the local road network and local meteorological conditions to predict pollution concentrations at specific locations selected by the user. Meteorological data from Stansted Airport Meteorological Station for 2019 has been used for the assessment.
- 7.16 Quantitative assessment of the impacts on local air quality from road traffic emissions associated with the operation of the Proposed Development have been completed against the current statutory standards and objectives set out in the Air Quality Strategy, provided below in **Table 7.1A.**

Table 7.1A: Air Quality Objectives set out in the Air Quality Strategy

POLLUTANT	CONCENTRATION	MEASURED AS	DATE TO BE ACHIEVED BY
Nitrogen Dioxide (NO ₂)	200 µg/m ³ not to be exceeded more than 18 times per year	1 hour mean	31 December 2005
	40 µg/m ³	Annual Mean	31 December 2005
Particulate Matter (PM ₁₀)	50 µg/m ³ not to be exceeded more than 35 times per year	24 hour mean	31 December 2004
	40 µg/m ³	Annual Mean	31 December 2004
Particulate Matter (PM _{2.5})	25 µg/m ³	Annual Mean	31 December 2010

- 7.17 Full details of the methodology employed for the operational assessment of traffic emissions are set out in the Air Quality Technical Report, **Appendix 7.1 of the original ES.**

Emissions Data

- 7.18 The model uses traffic flow data and vehicle related emission factors to predict road specific concentrations of NO_x and particulate matter (PM₁₀ and PM_{2.5}) at selected receptors.
- 7.19 The assessment has predicted air quality during 2019 for model verification. The emission factors released by Defra in August 2020, provided in the emissions factor toolkit EFT2020_v10.0 (Defra 2020) have been used to predict traffic related emissions of PM and NO_x.
- 7.20 Emission factors and background data used in the prediction of future air quality concentrations predict a gradual decline in pollution levels over time due to improved emissions from new vehicles and the gradual renewal of the vehicle fleet. In recent years the Defra emission factors published within the Emission Factor Toolkits (EFT) have been found to predict lower NO_x

concentrations in future years compared to concentrations measured at roadside locations across the UK. However, research carried out by Air Quality Consultants Ltd (AQC) has now shown that emissions of NO_x from vehicles within the recently released EFT are now matching concentrations recorded at roadside locations between 2013 to 2019. The report concludes that *'the EFT is now unlikely to over-state the rate at which NO_x emissions decline into the future at an 'average' site in the UK. Indeed, the balance of evidence suggests that, on average, NO_x concentrations are likely to decline more quickly in the future than predicted by the EFT'*. This has removed the need for the use of any sensitivity tests for future year scenarios.

- 7.21 In light of the above, the relevant future year EFT emissions data have been used to predict concentrations in the 2026 future year scenarios. The year 2026 has been adopted as a worst case assessment of opening year to provide a robust assessment.

Background Data

- 7.22 The ADMS model estimates concentrations arising as a result of vehicle emissions. It is necessary to add an estimate of local background concentrations to obtain the total concentration for comparison against the air quality objectives.
- 7.23 Background concentrations of NO₂ for use within the modelling assessment have been taken from monitoring site UTO12, located at the Town Hall. Data for 2019 has been used.
- 7.24 Estimated concentrations of PM₁₀ and PM_{2.5} have been taken from the Defra 2018 based background maps (Defra 2018), published in August 2020. Concentrations have been extracted from the 2019 maps for the grid square which represent the Site and adjacent road network.
- 7.25 Data for 2019 has been used for the 2026 scenario as a cautious approach, assuming no decline in background levels between the base year and future year scenario.
- 7.26 Full details of the background data used within the modelling assessment are provided in the Air Quality Technical Report, **Appendix 7.1 of the original ES**.

Traffic Data

- 7.27 Traffic data for use in the assessment has been provided by Cotswold Transport Planning. The 2019 base flows have been used for model verification against local monitoring data.
- 7.28 Future year traffic flows have been provided for the following scenarios in 2026:
- 2026 Do Minimum Scenario (including base flows and committed developments); and
 - 2026 Do Something Scenario (including the Do Minimum flows plus Proposed Development trips).
- 7.29 The traffic data used within the assessment is provided in Appendix C of the Air Quality Technical Report, **Appendix 7.1 of the original ES**.
- 7.30 Traffic generated by other committed developments in the area have been included within the 2026 Do Minimum scenario, including:
- UTT/13/3467/OP - outline planning permission for up to 230 dwellings including link road and primary school;
 - UTT/16/1856/DFO - reserved matters for 200 dwellings approved Jan 2017;

- 17/2832/OP - outline application for 100 dwellings approved July 2020; and
- 18/0824/OP - outline application approved April 2019 for up to 150 units.

- 7.31 The 2026 assessment scenarios also take account of the new link road between Radwinter Road to the north and Thaxted Road to the south, being constructed as part of a number of committed developments west of the Site including UTT/13/3467/OP and 17/2832/OP. However, an additional assessment has been carried out, as detailed in **Appendix 7.5A**, which considers the impact of the development with no link road in place. This additional assessment work has been shared with UDC, and their EHO has accepted its findings, and withdrawn their objection on this basis (see **Appendix 7.6A**).
- 7.32 Traffic speeds have been assigned to each link road based on local traffic speed restrictions and the presence of junctions. Slower speeds have been assigned at junctions to take account of queuing and turning traffic.
- 7.33 As part of the application a number of improvements are being proposed to include the following:
- Radwinter Road/Thaxted Road/East Street/Chatters Hill - addition of a short separate right turn lane on Radwinter Road;
 - Thaxted Road/Peasland Road - conversion of exiting mini roundabout to traffic signals; and
 - High Street/Church Street - conversion of existing priority junction to traffic signals.
- 7.34 Full details of the junction improvements are set out within the Transport Assessment (Chapter 12 and **Appendix 12.1**) along with the junction analysis. The data shows that the improvements would result in a significant reduction in queue lengths at the relevant junctions compared to the existing situation. These improvements would, therefore, have a positive impact on air quality. The modelling assessment has made no change to vehicle speeds at the relevant junctions under the 'do something' scenario to account for the reduced queue lengths, therefore, the assessment represents a worst-case prediction of emissions at each junction.

Model Outputs and Results Processing

- 7.35 The ADMS Model has predicted traffic related annual mean emissions of NO_x and PM at existing receptors within Saffron Walden and proposed receptors within the Site. Relevant background concentrations have subsequently been added to the model outputs to provide the total concentrations of each pollutant.
- 7.36 The predicted concentrations of NO_x have been converted to NO₂ using the LAQM calculator (Version 8.1, released August 2020 (Defra 2020)).
- 7.37 Analysis of long-term monitoring data suggests that if the annual mean NO₂ concentration is less than 60 µg/m³ then the one-hour mean NO₂ objective is unlikely to be exceeded where road transport is the main source of pollution. Therefore, in this assessment the annual mean concentration has been used to screen whether the one-hour mean objective is likely to be achieved as recommended within LAQM.TG(16). Similar to NO₂, an annual mean PM₁₀ concentrations below 32 µg/m³ is used to screen whether the 24-hour PM₁₀ mean objective is likely to be achieved, the approach also recommended within LAQM.TG(16).

Model Verification

- 7.38 It is recommended that the model results are compared with measured data to determine

whether the model results need adjusting to more accurately reflect local air quality. This process is known as verification.

- 7.39 To verify the model results, the ADMS model has been used to predict NO_x concentrations at 10 monitoring sites located within the town of Saffron Walden.
- 7.40 Full details of the verification and calculation of adjustment factors is provided in Appendix D of the Air Quality Technical Report, **Appendix 7.1 of the original ES**.

Receptors

- 7.41 LAQM.TG(16) describes in detail typical locations where consideration should be given to pollutants defined in the Regulations. Generally, the guidance suggests that all locations 'where members of the public are regularly present' should be considered. At such locations, members of the public would be exposed to pollution over the time that they are present, and the most suitable averaging period of the pollutant needs to be used for assessment purposes.
- 7.42 For instance, on a footpath, where exposure would be transient (for the duration of passage along that path) comparison with short-term standards (i.e. 15 minute mean or 1 hour mean) may be relevant. In a school, or adjacent to a private dwelling, however; where exposure may be for longer periods, comparison with long-term standards (such as 24 hour mean or annual mean) may be most appropriate. In general terms, concentrations associated with long-term standards are lower than short-term standards owing to the chronic health effects associated with exposure to low level pollution for longer periods of time.
- 7.43 For the completion of this assessment, air quality has been predicted at the facades of sensitive receptors (i.e. residential properties, schools, care homes etc) located adjacent to the road links included in the model. Each receptor has been selected to represent worst-case exposure to local traffic emissions (R1 to R69).
- 7.44 A number of receptors have also been selected to represent exposure within the Site (P1 to P6). These receptors have been selected adjacent to Radwinter Road and the new access road to represent worst-case exposure within the Site.
- 7.45 The details of each receptor are provided in the Air Quality Technical Report, **Appendix 7.1 of the original ES**. Maps showing the location of these receptors are provided in **Appendix 7.2 of the original ES**.

Significance Criteria

- 7.46 The assessment of likely significant environmental effects as a result of the Proposed Development has taken into account the construction and operational phases.
- 7.47 The duration of the effects have 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.

Construction Phase

- 7.48 The significance of effects predicted during the construction phase of the Proposed Development is based on criteria set out in the IAQM guidance. In the first instance the sensitivity of the area and receptors being assessed are established based on the criteria set out in **Table 7.2A**.

Table 7.2A: Factors Defining the Sensitivity of the Area and Adjacent Receptors

SENSITIVITY OF AREA/ RECEPTORS	RECEPTOR TYPE	ECOLOGICAL RECEPTORS
	HUMAN RECEPTORS	
Very High	Very densely populated area, more than 100 dwellings within 20m. Local PM ₁₀ concentrations exceed the objective. Contaminated buildings present. Very sensitive receptors (e.g. oncology units). Works continuing in one area of the Site for more than a year.	European Designated Sites
High	Densely populated area. 10-100 dwellings within 20m of the Site. Local PM ₁₀ concentrations close to the objective (e.g. 36-40 µg/m ³). Commercially sensitive horticultural land within 20m.	Nationally designated site
Medium	Suburban or edge of town area. Less than 10 receptors within 20 May 2021 Local PM ₁₀ concentrations below the objective (e.g. annual mean 30-36 µg/m ³).	Locally Designated Site
Low	Rural area/industrial area. No receptors within 20m. Local PM ₁₀ concentrations well below the objective (less than 75%). Wooded area between the Site and receptors.	No Designations

7.49

Following the IAQM guidance the risk of each construction activity giving rise to dust effects is determined as high, medium or low. The risk of dust effects is then assessed against the sensitivity of the area/receptors, as defined in **Table 7.2A**, to ascertain the significance of effects for each activity (**Table 7.3A**). However, as the implementation of best practice mitigation is standard practice following the IAQM guidance, it is recommended that the significance of effects is assessed post-mitigation, using the criteria set out in **Table 7.4A**.

Table 7.3A: Significance of Effects for Each Activity Prior to Mitigation

MAGNITUDE OF EFFECT	SENSITIVITY OF AREA/RECEPTORS			
	VERY HIGH	HIGH	MEDIUM	LOW
High	Major Adverse	Major-Moderate Adverse	Moderate Adverse	Minor Adverse
Medium	Major-Moderate Adverse	Moderate Adverse	Moderate Adverse	Minor Adverse
Low	Moderate Adverse	Minor Adverse	Minor Adverse	Negligible
Negligible	Negligible	Negligible	Negligible	Negligible

Table 7.4A: Significance of Effects for Each Activity Following the Application of Mitigation

MAGNITUDE OF EFFECT	SENSITIVITY OF AREA/RECEPTORS			
	VERY HIGH	HIGH	MEDIUM	LOW
High	Minor Adverse	Minor Adverse	Negligible	Negligible
Medium	Minor Adverse	Negligible	Negligible	Negligible
Low	Negligible	Negligible	Negligible	Negligible
Negligible	Negligible	Negligible	Negligible	Negligible

Operational Phase

- 7.50 The significance of effects determined for the operational phase is based on criteria set out within the IAQM Air Quality Planning Guidance.
- 7.51 In the first instance the sensitivity of affected receptors has been considered on a scale of high, medium, low or negligible.
- 7.52 The level of sensitivity is determined based on the type of receptor and where the air quality objectives apply, as detailed in the UK Air Quality Strategy (see Table 3.2, Air Quality Technical Report, **Appendix 7.1**). In this respect, residential dwellings, hospitals and educational facilities are considered to be high sensitivity receptors.
- 7.53 The magnitude of any change in air quality as a result of the development is then determined as the change experienced from the baseline conditions at each receptor and has been considered on a scale of large, medium, small or negligible and is based on criteria set out within the IAQM guidance, as detailed in **Table 7.5A**.

Table 7.5A: Data Used to Determine Magnitude of Change

LONG-TERM AVERAGE CONCENTRATION AT RECEPTOR IN ASSESSMENT YEAR	% CHANGE IN CONCENTRATIONS RELATIVE TO AIR QUALITY ASSESSMENT LEVEL			
	1	2-5	6-10	>10
75% or less of AQAL	Negligible	Negligible	Small	Medium
76-94% of AQAL	Negligible	Small	Medium	Medium
95-102% of AQAL	Small	Medium	Medium	Large
103-109% of AQAL	Medium	Medium	Large	Large
110% of AQAL	Medium	Large	Large	Large

When using the above criteria the following has been taken into account:

- AQAL – Air Quality Assessment Level which in this assessment refers to the Air Quality Objectives set out in **Table 7.1A**.
- The percentage change in concentration should be rounded to a whole number.
- The table should only be used with annual mean concentrations.
- The descriptors are for individual receptors only.
- When defining the concentrations as a percentage of the AQAL use the 'without scheme' concentration where there is a decrease in pollutant concentrations and the 'with scheme' concentrations for an increase.
- The total concentration categories reflect the degree of potential harm by reference to the AQAL value. At exposure, less than 75% of this value i.e. well below, the degree of harm is likely to be small. As exposure approaches and exceeds the AQAL, the degree of harm increases. This change naturally becomes more important when the result is an exposure that is approximately equal to, or greater than the AQAL.
- It is unwise to ascribe too much accuracy to incremental changes or background concentrations, and this is especially important when total concentrations are close to the AQAL. For a given year, it is impossible to define the new total concentrations without recognising the inherent uncertainty, which is why there is a category that has a range around the AQAL, rather than being exactly equal to it.

7.54

The significance of operational effects is then determined based on the level of effect at each receptor, defined by the sensitivity of the receptor and the defined magnitude of change, as set out in **Table 7.6A**.

Table 7.6A: Level of Effects for Operational Phase

MAGNITUDE OF EFFECT	SENSITIVITY OF RECEPTORS			
	NEGLIGIBLE	LOW	MEDIUM	HIGH
Negligible	Negligible	Negligible	Negligible	Negligible
Low	Negligible	Negligible	Minor	Moderate
Medium	Negligible	Minor	Moderate	Substantial
High	Minor	Moderate	Substantial	Substantial

7.55

The overall significance of effects is informed by professional judgement. For each effect, it has been concluded whether the effect is 'beneficial' or 'adverse'. A statement is also made as to whether the level of effect is 'significant' or 'not significant', again based on professional judgement. In line with EIA Regulations, effects that are classed as negligible or minor are not considered significant.

Limitations and Assumptions

7.56

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

- 7.57 The model will be dependent on the traffic data provided by the transport consultants which will have inherent uncertainties associated with them. Further uncertainty will also be introduced as the ADMS model is required to simplify real-world conditions into a series of algorithms.
- 7.58 A disparity between national road transport emission projections and measured annual mean concentrations of nitrogen oxides and NO₂ have been identified in recent years. Whilst projections suggest that annual mean concentrations from road traffic emissions should have fallen significantly, monitoring has not reflected this and has shown relatively stable levels in some locations. To reduce limitations within the model, appropriate verification and adjustment of the model results has been carried out using Defra recommended approaches, the model has assumed no change in background concentrations between current and future years to provide a cautious prediction of future concentrations and the latest emissions factors have been used which have been shown to represent a better prediction of real-world conditions than previous versions.

Existing Baseline Conditions

UDC Review and Assessment of Air Quality

- 7.59 UDC has completed a number of detailed assessments of air quality in the district, which has identified exceedances of the annual mean NO₂ objective, and resulted in the declaration of an AQMA covering a circular area with a radius of 1.4 km centred on Elm Grove within the centre of Saffron Walden. The location of the AQMA is shown in **Appendix 7.3 of the original ES**.
- 7.60 The Site is located 0.8km to the east of the AQMA. Air quality in the immediate vicinity of the Site has been found to be meeting the relevant air quality objectives, however, due to the close proximity of the AQMA, there is the potential for traffic generated during the operational phase to impact air quality within the AQMA.

Air Quality Monitoring

Nitrogen Dioxide

- 7.61 During 2019, UDC monitored NO₂ concentrations at two automatic monitoring sites and 16 diffusion tube sites within Saffron Walden. Full details of these sites and data recorded at them is set out in Table 5.1 of the Air Quality Technical Report, **Appendix 7.1. of the original ES**. However, a map showing the locations of the monitoring sites is provided in **Appendix 7.3 of the original ES**.
- 7.62 No monitoring of pollution concentrations is carried out in the immediate vicinity of the development Site. The nearest monitor is located on Radwinter Road approximately 1km to the west of the Site.
- 7.63 Annual mean NO₂ concentrations below the objective of 40 µg/m³ were recorded at all monitoring sites in Saffron Walden during 2019. Historically, exceedances of the annual mean objective were recorded at monitoring sites UT001 in 2016, UT004 and UT005 in 2015 and 2016 and UT028 in 2016. However, the data indicates a downward trend in concentrations across the town with concentrations at all four of these sites falling to below the objective between 2017 and 2019.
- 7.64 At monitoring sites UTT2 and UTT3 exceedances of the 200µg/m³ 1-hour objective limit have been recorded in previous year, however, not on a sufficient number of occasions for the objective to be exceeded which allows up to 18 exceedances of the limit in any given year.

7.65 Short-term NO₂ concentrations cannot be recorded by diffusion tubes, therefore, no short-term data is available. However, as discussed in paragraph 7.37, the LAQM.TG(16) guidance indicates that where the annual mean is below 60 µg/m³ it can be assumed that exceedances of the 1 hour objective for NO₂ are unlikely to occur. Based on annual mean concentrations recorded across the town, it is unlikely that the short-term NO₂ objective is being exceeded at any of the monitoring locations.

7.66 The baseline assessment of NO₂ indicates that currently both the annual mean and short-term objective limits are being met at locations both within and outside the Saffron Walden AQMA.

Particulate Matter (PM₁₀ and PM_{2.5})

7.67 UDC monitor PM₁₀ concentrations at one site (UTT3) within Saffron Walden and PM_{2.5} at two sites (UTT1 and UTT3). The locations of both sites are shown in Figure 7.3.2, **Appendix 7.3. of the original ES**

7.68 PM₁₀ and PM_{2.5} concentrations recorded at the above monitoring sites is set out in Tables 5.2 and 5.3 within the Air Quality Technical Report, **Appendix 7.1 of the original ES.**

7.69 Monitoring of PM₁₀ shows annual mean concentrations are well below (<75%) the objective at the monitoring site since 2016.

7.70 The monitoring site recorded exceedances of the 24-hour objective limit of 50 µg/m³ in all four monitoring years since 2016, however, as the objective allows for up to 35 exceedances in any given year, the objective has not been exceeded at this monitoring location.

7.71 The data shows no consistent trend in concentrations with little change in the annual mean recorded during all four years presented.

7.72 The data shows PM_{2.5} concentrations to be well below the annual mean objective of 25 µg/m³ at the monitoring locations since 2016. The data shows no consistent trend in concentrations with some years showing an increase and others a decrease.

Defra Background Maps

7.73 Additional information on estimated background pollutant concentrations has been obtained from the DEFRA 2018 background maps provided on UK-AIR, the Air Quality Information Resource (<http://uk-air.defra.gov.uk>). Estimated air pollution concentrations for NO₂, PM10 and PM_{2.5} have been extracted from the 2018 based background pollution maps for the UK and are set out in **Table 7.7A.**

7.74 These maps are available in 1km by 1km grid squares and provide an estimate of concentrations between 2018 and 2030. The average concentrations for each grid square representing each of the modelled receptor locations have been extracted from the 2019 base year and are set out in **Table 7.7A.**

7.75 The data indicates that background concentrations in the vicinity of the Site are expected to comfortably meet the NO₂, PM₁₀ and PM_{2.5} objectives.

Table 7.7A: Annual Mean Background Air Pollution Concentrations from Defra Maps ($\mu\text{g}/\text{m}^3$)

OS GRID SQUARE	NO ₂	PM ₁₀	PM _{2.5}
553500, 237500	10.0	15.3	9.6
554500, 237500	9.5	15.5	9.8
553500, 238500	9.9	15.0	9.5
554500, 238500	11.3	14.9	9.7
555500, 238500	8.5	15.7	9.6

Baseline Modelling Results

- 7.76 Baseline pollution concentrations have been predicted in 2019 at the receptors shown in **Appendix 7.2 of the original ES** using the ADMS Roads dispersion model. Predicted NO₂, PM₁₀ and PM_{2.5} concentrations in 2019 are set out in Table 7.4.1, **Appendix 7.4 of the original ES**.
- 7.77 The modelling is predicting annual mean NO₂ concentrations below the objective limit at all the selected receptors under the 2019 base scenario, although concentrations are predicted to be only just below the objective at receptor R42, located on London Road.
- 7.78 Based on the annual mean concentrations being less than 60 $\mu\text{g}/\text{m}^3$ at all receptor locations, short-term NO₂ concentrations are meeting the 1-hour objective.
- 7.79 Annual mean PM₁₀ and PM_{2.5} concentrations are predicted to be well below the annual mean objective limits for both pollutants at all receptor locations.
- 7.80 Given that annual mean PM₁₀ concentrations are below 32 $\mu\text{g}/\text{m}^3$, the 24-hour objective is also being met at all locations within the town.

Evolution of the Baseline Conditions without Development

- 7.81 NO₂, PM₁₀ and PM_{2.5} concentrations have been predicted in 2026, assuming a 'do minimum' scenario. The results of this modelling are set out in Table 7.4.1, **Appendix 7.4 of the original ES**.
- 7.82 The model results predict a decline in annual mean NO₂ concentrations between 2019 and 2026, due to improvement in vehicle emissions and changes in the vehicle fleet to include a higher proportion of low emission vehicles. By 2026 annual mean NO₂ concentrations are predicted to be well below the objective at all receptor locations.
- 7.83 The modelling is predicting a small increase in PM₁₀ and PM_{2.5} concentrations between 2019 and 2026, however, at all receptors concentrations remain well below the objective limits.

Predicted Impacts

Construction Phase

- 7.84 The Site covers an area of 18.3ha and there are residential properties located within 350m of the Site. An assessment of impacts in relation to human receptors is therefore required.

7.85 Dust emissions from construction activities are unlikely to result in significant impacts on ecologically sensitive receptors beyond 50m from the Site boundary. A review of data held on the Defra MAGIC website (Defra 2021) shows no sites designated as important for wildlife within 50m of the Site, therefore, impacts on ecological receptors has not been considered any further within this assessment.

7.86 The data set out in **Table 7.6A** indicates background concentrations in the region of 15-16 $\mu\text{g}/\text{m}^3$. Based on professional judgment, it is anticipated that PM_{10} concentrations at the Site and at adjacent properties are unlikely to be much higher than background, therefore, PM_{10} concentrations are expected to be below $24\mu\text{g}/\text{m}^3$.

Construction Traffic

7.87 Based on the development proposals and anticipated phasing, it is estimated that there would be in the region of 20-30 additional Heavy-Duty Vehicles (HDV) generated on the adjacent road network on any given day.

7.88 The EPUK & IAQM air quality guidance assessment criteria indicate that significant impacts on air quality are unlikely to occur where a development results in less than 25 HDV movements per day in locations within or adjacent to an AQMA and less than 100 HDV outside of an AQMA. Following distribution of the trips on the adjacent road network, it is expected that there would be no more than 25 HDV movements per day on any one road link during the construction phase. It is, therefore, anticipated that construction traffic generated by the Proposed Development would result in a negligible impact on local NO_2 and PM_{10} concentrations. Furthermore, impacts as a result of construction traffic would be temporary and short-term in nature.

7.89 Impacts from construction traffic are not, therefore, considered to be significant.

Construction Dust

7.90 Full details of the assessment of construction dust effects is predicted in Section 6.2 of the Air Quality Technical Report set out in **Appendix 7.1 of the original ES**. However, the results of the assessment are summarised here.

Potential Dust Emission Magnitude

7.91 The dust emission magnitude is based on the scale of anticipated works at the Site and has been classified as small, medium or large for each of the four activities; demolition, earthworks, construction and trackout. A summary of the dust emission magnitude for each activity is set out in **Table 7.8A**.

- **Demolition:** There is a single barn that would require demolition as part of the application. The barn has a volume of $< 1500 \text{ m}^3$ and, therefore, has a dust emission class of 'small'.
- **Earthworks:** The Site covers an area of 18.3ha ($183,000 \text{ m}^2$) and during the earthworks stage it is anticipated that more than 100,000 tonnes of material would be excavated, with more than 10 heavy earth moving vehicles on-site at any one time. The Site is, therefore, considered to have a dust emission class of 'large' with regards to earthwork activities.
- **Construction:** Based on the current design layouts, the total building volume proposed for the Site would be 55,000 to 65,000 m^3 and the main construction materials would be steel and concrete. The Site is, therefore, considered to have a dust emission class of 'medium' with regards to construction activities.

- **Trackout:** Given the size of the Site and nature of the Proposed Development, it is anticipated that there would be in the region of 20-30 HDV accessing the Site on a daily basis. Furthermore, vehicles would be travelling over unpaved roads, which can result in mud and dust trackout onto the adjacent road network. The Site is, therefore, considered to have a dust emissions class of 'medium' with regards to trackout activities.

Table 7.8A: Summary of Dust Emissions Magnitude for each Activity

SOURCE	MAGNITUDE
Demolition	Small
Earthworks	Large
Construction	Medium
Trackout	Medium

Sensitivity of Area

- 7.92 Based on the IAQM guidance, residential dwellings are considered as high sensitivity receptors in relation to both dust soiling and health effects of PM₁₀.
- 7.93 There is one property located to the west within 20m of the Site boundary. Beyond this the nearest properties are approximately 60m to the west on Griffin Place and Fairfax Drive. To the east, the nearest residential properties are over 200m from the Site. The overall sensitivity of the surrounding area is classed as 'medium' in relation to dust soiling. However, there are no residential properties located within 250m of the building requiring demolition, therefore, the sensitivity to dust effects from demolition will be 'low'.
- 7.94 As previously discussed, annual mean PM₁₀ concentrations in the vicinity of the Site are not expected to exceed 24 µg/m³. Based on the proximity of sensitive receptors to the Site boundary and the local concentrations of PM₁₀, the sensitivity of the surrounding area is considered to be 'low' with regards human health impacts.
- 7.95 In relation to trackout, vehicles travelling to and from the Site would travel along Radwinter Road either to the east or west. As a general guidance, significant impacts from trackout may occur up to 500m from large sites, 200m from medium sites and 50m from small sites, as measured from the Site exit. There are fewer than 10 residential receptors within 20m of the roadside located adjacent to Radwinter Road to the west, within 500m of the Site access point. The sensitivity of receptors is, therefore, considered to be 'medium' in relation to dust soiling and 'low' in relation to human health impacts from trackout.

Defining the Risk of Impacts

- 7.96 The dust emission magnitude, as set out in **Table 7.8A**, is combined with the sensitivity of the area to determine the risk of both dust soiling and human health impacts, assuming no mitigation measures are applied at the Site. The risk of impacts associated with each activity is provided in **Table 7.9A**.

Table 7.9A: Summary of Risk Effects to Define Site Specific Mitigation

SOURCE	ACTIVITY			
	DEMOLITION	EARTHWORKS	CONSTRUCTION	TRACKOUT
Dust Soiling	Negligible	Medium Risk	Medium Risk	Low Risk
Human Health	Negligible	Low Risk	Low Risk	Low Risk

Operational Phase**Impacts at Existing Receptors*****With Radwinter Road and Thaxted Road Link Road in Place***

- 7.97 Pollution concentrations predicted under the 'Do Something' scenario and compared against the 'Do Minimum' scenario are set out in Tables 7.4.2 to 7.4.4, **Appendix 7.4 of the original ES**.
- 7.98 The modelling is predicting annual mean NO₂ concentrations below the objective (AQAL) at all the selected receptors under both 2026 assessment scenarios.
- 7.99 Traffic generated by the operational development is predicted to increase annual mean NO₂ concentrations by up to 0.3 µg/m³, which is equivalent to no more than 1% of the AQAL (Table 7.4.2, **Appendix 7.4 of the original ES**). As concentrations are predicted to remain at less than 70% of the AQAL at all receptor locations, the impact is deemed to be negligible based on the criteria set out in **Table 7.5A**.
- 7.100 At all receptor locations considered in the assessment, annual mean NO₂ concentrations are predicted to be less than 60 µg/m³. Impact on short-term NO₂ concentrations would, therefore, also be negligible.
- 7.101 Traffic generated by the Proposed Development is predicted to increase annual mean PM₁₀ concentrations by no more than 0.1 µg/m³, which equates to less than 1% of the AQAL (Table 7.4.3, **Appendix 7.4 of the original ES**). The impact on annual mean concentrations would, therefore, be negligible.
- 7.102 Annual mean concentrations are predicted to remain at less than 32 µg/m³ at all receptors. The impact on 24-hour PM₁₀ concentrations would, therefore, be negligible.
- 7.103 Traffic generated by the operational development is predicted to increase annual mean concentrations by no more than 0.1 µg/m³, which equates to <1% of the AQAL (Table 7.4.4, **Appendix 7.4 of the original ES**) and is deemed to be a negligible impact.

Without Radwinter Road and Thaxted Road Link Road in Place

- 7.104 Details of the assessment of impacts without the link road in place are set out in the Air Quality Technical Note provided in **Appendix 7.5A**. The assessment has predicted NO₂, PM₁₀ and PM_{2.5} concentrations at existing receptors under the future 2026 Do Minimum and Do Something scenarios, assuming no link road under both scenarios.
- 7.105 Traffic generated by the operational development is predicted to increase annual mean NO₂ concentrations at the majority of receptors considered in the additional modelling scenarios (See Appendix C of the Technical Note, **Appendix 7.5A**). The highest impact is predicted at

receptors R5, R6, R15, R17 and R34, which are located close to the Thaxted Road/Radwinter Road junction. However, the impact equates to 1% of the AQAL which is classed as a negligible impact due to concentrations remaining well below the AQAL.

- 7.106 At all other locations the predicted impact is predicted to be between 0 and 1% of the AQAL and is, therefore, also deemed to be negligible.
- 7.107 In respect of PM₁₀ and PM_{2.5} annual mean concentrations are predicted to increase by less than 1% of the relevant AQAL of 40 µg/m³ and 25 µg/m³, respectively. Impacts on both pollutants would, therefore, be negligible.
- 7.108 Overall, the impact of the development, if the new road link is not completed, would be negligible at all locations within Saffron Walden. This conclusion is accepted by the Council's EHO who responded to the additional assessment work on 14 December 2021, withdrawing their objection to the Proposed Development on this basis (see **Appendix 7.6A**).

Impacts at Proposed Receptors

- 7.109 Annual mean NO₂, PM₁₀ and PM_{2.5} concentrations predicted along the northern boundary of the Site and adjacent to the proposed access road are set out in **Table 7.10A**.
- 7.110 The modelling assessment is predicting annual mean concentrations of all three pollutants well below the relevant objective limits.
- 7.111 Annual mean NO₂ concentrations are also predicted to be significantly less than 60 µg/m³, while annual mean PM₁₀ concentrations are predicted to be well below 32 µg/m³, therefore, concentrations are meeting the short-term objectives for both pollutants.

Table 7.10A: Predicted Annual mean Concentrations at Proposed Receptors under 2026 Do Something Scenario (µg/m³)

RECEPTOR	POLLUTANT			SIGNIFICANCE OF IMPACT (EXPOSURE)
	NO2	PM10	PM2.5	
P1	16.7	15.9	9.7	Negligible
P2	18.1	16.4	10.0	Negligible
P3	18.6	16.6	10.1	Negligible
P4	16.5	15.8	9.6	Negligible
P5	17.5	16.2	9.9	Negligible
P6	16.1	15.7	9.6	Negligible

Evaluation of Predicted Impacts

Construction Phase

Construction traffic

- 7.112 Any emissions associated with construction traffic would be short-term and temporary.

- 7.113 Effects associated with construction traffic have been determined as **negligible**, therefore, impacts would not be significant.

Construction Dust

- 7.114 The IAQM guidance recommends that the impacts associated with construction activities are assessed post mitigation given that the majority of measures are mandatory and follow best practice. However, to follow the approach recommended in the EIA Regulations, the effects assessed and set out in **Table 7.8A** have been assessed for significance prior to the implementation of mitigation.

- 7.115 Any impacts associated with construction will be short-term, temporary and reversible.

- 7.116 The assessed effects are determined as **moderate adverse** based on a medium to low magnitude of change and medium sensitivity of the surrounding area.

Operational Phase

Impacts on Existing Receptors

- 7.117 The change in pollutant concentrations (NO₂, PM₁₀, and PM_{2.5}) has been assessed as **negligible** as a result of traffic generated by the operational development **both with and without the link road in place**. The effects are, therefore, assessed as not significant at all existing receptors.

Impacts on Proposed Receptors

- 7.118 Pollutant concentrations at the Site are predicted to be significantly below the relevant air quality objectives. The impact of the development in terms of new exposure is, therefore, assessed as not significant/**negligible**.

Mitigation

Construction Phase

- 7.119 To ensure there are no significant effects during the construction phase of the development the following mitigation measures will be implemented through a site specific CEMP, which can be secured by a suitably worded planning condition. These measures are based on those recommended within the IAQM guidance:
- Develop and implement a stakeholder communications plan that includes community engagement before work commences on site;
 - Display the name and contact details of the person accountable for air quality and dust issues on the Site boundary (i.e. the environment manager/engineer or site manager);
 - Record all dust and air quality complaints, identify cause, take appropriate measures to reduce emissions in a timely manner and record the measures taken;
 - Make the complaints log available to the local authority when asked;
 - Record any exceptional incidents that cause dust and/or air emissions, either on- or off- site and the action taken to resolve the situation in the log book;
 - Carry out regular site inspections to monitor compliance with the Dust Management Plan (DMP), record inspection results and make inspection log available to UDC when asked;
 - Increase frequency of site inspection by the person accountable for air quality and dust issues on site when activities with a high potential to produce dust are being carried out and during prolonged periods of dry or windy conditions;

- Plan site layout so that machinery and dust causing activities are located away from receptors, as far as is possible;
- Erect solid screens or barriers around dusty activities or the Site boundary that are at least as high as any stockpiles;
- Fully enclose site or specific operations where there is a high potential for dust production and the Site is active for extensive periods;
- Avoid site runoff of water or mud;
- Keep site fencing, barriers and scaffolding clean using wet methods;
- Remove materials that have a potential to produce dust from site as soon as possible, unless being re-used on site;
- Cover, seed or fence stockpiles to prevent wind whipping;
- Ensure all vehicles switch off engines when stationary - no idling vehicles;
- Avoid the use of diesel or petrol powered generators and use mains electricity or battery powered equipment where practicable;
- Produce a Construction Logistics Plan to manage the sustainable delivery of goods and materials;
- Implement a Travel Plan that supports and encourages sustainable travel (public transport, cycling, walking and car-sharing);
- Only use cutting, grinding or sawing equipment fitted or in conjunction with suitable dust suppression techniques such as water sprays or local extraction e.g. suitable local exhaust ventilation systems;
- Ensure an adequate water supply on site for effective dust/particulate matter suppression/mitigation, using non-potable water where possible and appropriate;
- Use enclosed chutes and conveyors and covered skips;
- Minimise drop heights from conveyors, loading shovels, hoppers and other loading or handling equipment and use fine water sprays on such equipment wherever appropriate;
- Ensure equipment is readily available on site to clean any dry spillages, and clean up spillages as soon as reasonably practicable after the event using wet cleaning methods;
- Avoid bonfires and burning of waste materials;
- Install hard surfaced haul routes, which are regularly damped down with fixed or mobile sprinkler systems, or mobile water bowsers and regularly cleaned;
- Ensure sand and other aggregates are stored in bunded areas and are not allowed to dry out, unless this is required for a particular process, in which case ensure that appropriate additional controls measures are in place;
- Ensure there is an adequate area of hard surfaced road between the wheel wash facility and the Site exit;
- Access gates to be located at least 10m from receptors where possible;
- Undertake daily on-site and off-site inspection, where receptors (including roads) are

nearby, to monitor dust, record inspection results and make the log available to the local authority when asked. Ensure there is an adequate area of hard surfaced road between the wheel wash facility and the Site exit;

- Re-vegetate earthworks and exposed areas/soil stockpiles to stabilise surfaces as soon as practicable;
- Use hessian, mulches or trackifiers where it is not possible to re-vegetate or cover with topsoil, as soon as possible;
- Only remove the cover in small areas during work and all at once;
- Avoid scabbling if possible;
- Ensure bulk cement and other fine powder materials are delivered in enclosed tankers and stored in silos with suitable emission control systems to prevent escape of material and overfilling during delivery;
- For smaller supplies of fine powder materials ensure bags are sealed after use and stored appropriately to prevent dust;
- Use water-assisted dust sweepers on the access and local roads, to remove, as necessary, any material tracked out of the Site;
- Avoid dry sweeping of large areas;
- Ensure vehicles entering and leaving the Site are covered to prevent the escape of materials during transport; and
- Implement a wheel washing system (with rumble grids to dislodge accumulated dust and mud).

Operational Phase

7.120

The modelling assessment has predicted a negligible impact on local air quality as a result of operational traffic. However, it is acknowledged that operational traffic will contribute to local air quality as a result of additional vehicle emissions. The following mitigation measures have been incorporated into the scheme design to help reduce emissions:

- Secure cycle storage for residential units without covered parking or garages;
- Passive provision for electric charging points will be provided for all on-plot car parking spaces;
- A travel pack will be provided to all residents as part of the Travel Plan measures setting out public transport options, promoting cycling and walking routes;
- A Travel Plan (TP) will be developed for the Site which will implement measures to encourage the use of alternative more sustainable modes of transport and reduce the use of single occupancy car journeys;
- Where provided, all gas fired boilers will meet a minimum rating of <40 KgNO_x/kWh;
- Provision of a bus stop on Radwinter Road in close proximity to the new Site access point providing access to services between Aduley End Train Station and Haverhill and providing an additional point on the east/west route connecting secondary schools in the area; and
- Provision of large public open space area for recreational purposes, reducing the need for residents to travel further afield for recreational needs.

- 7.121 The above measures can be controlled by either appropriately worded planning conditions or legal agreement. It is also noted that the Site is within walking distance of bus stops serving local bus routes between Saffron Walden and Stansted Airport and Bishops Stortford, plus a local circular route to various destinations within the town.

Residual Effects

Construction Phase

- 7.121.1 Following implementation of the measures that will be incorporated into the Site-specific CEMP, the residential effects will be **negligible** and, therefore, not significant.

Operational Phase

- 7.122 Following incorporation of the mitigation measures within the scheme design, residential effects will remain **negligible** and not significant.

Cumulative Effects

Construction Phase

- 7.123 Potential cumulative construction effects could occur should construction of other consented development occur at the same time as the Proposed Development, and where receptors are within sufficient distance of each site to experience effects from both. The IAQM guidance indicates that significant effects can occur up to 350m from construction activities, therefore, cumulative effects would only occur where there are other construction sites within 700m of the Proposed Development with receptors in between.
- 7.124 The following schemes are within 700m of the Proposed Development and could be under construction at the same time:
- UTT/13/3467/OP - outline planning permission for up to 230 dwellings including link road and primary school;
 - UTT/16/1856/DFO - RM for 200 dwellings approved Jan 2017;
 - 17/2832/OP - outline application for 100 dwellings approved July 2020; and
 - 18/0824/OP - outline application approved April 2019 for up to 150 units.
- 7.125 Significant cumulative effects are unlikely to occur as each development is anticipated to employ similar dust mitigation techniques such that the individual construction phase effect should be not significant, alone or cumulatively. Furthermore, it is unlikely that construction traffic from the other committed development would use the same construction traffic routes as specified for this development. Therefore, cumulatively, the trip generation is unlikely to exceed the EPUK and IAQM assessment criteria and impacts are unlikely to be significant.

Operational Phase

- 7.126 It is understood that the future baseline traffic flows include the committed trip generation associated with the following schemes:
- UTT/13/3467/OP - outline planning permission for up to 230 dwellings including link road and primary school;
 - UTT/16/1856/DFO - RM for 200 dwellings approved Jan 2017;
 - 17/2832/OP - outline application for 100 dwellings approved July 2020; and
 - 18/0824/OP - outline application approved April 2019 for up to 150 units.

- 7.127 The modelling assessment has, therefore, taken account of traffic generated by approved developments in the vicinity of the Site. Concentrations of all three pollutants would remain below the relevant air quality objectives with both the approved developments and Proposed Development in operation, therefore, the assessment of cumulative effects is inherent to the assessment provided and cumulative impacts are considered to be negligible in terms of local air quality and, therefore, not significant.

Monitoring

- 7.128 The residual effects have been assessed as not significant, therefore, no monitoring is required.

Summary of Impacts

- 7.129 The likely significant effects of the construction and operational phases of the Proposed Development in terms of air quality have been assessed.
- 7.130 On the basis that there will be a site specific CEMP which will incorporate measures to reduce dust and traffic emissions, emissions as a result of construction activities will be adequately mitigated and impacts will be not significant.
- 7.131 The ADMS dispersion model has been used to predict the impact of the operational development on local NO₂, PM₁₀ and PM_{2.5} concentrations. The assessment has used conservative assumption to predict impacts in 2026. [The assessment has also considered scenarios where the new link road between Radwinter Road and Thaxted Road is in operation and where the new link road is not brought forward.](#)
- 7.132 The assessment has predicted a negligible impact on concentrations of all three pollutants as a result of operational traffic [both with and without the link road in place](#). The impact of the proposals on existing receptors would be not significant.
- 7.133 The assessment has predicted NO₂, PM₁₀ and PM_{2.5} concentrations 'well below' the relevant objective limits at all proposed receptors. The impact of the Development in relation to new exposure would be not significant.
- 7.134 A summary of the effects is set out in **Table 7.11A**.

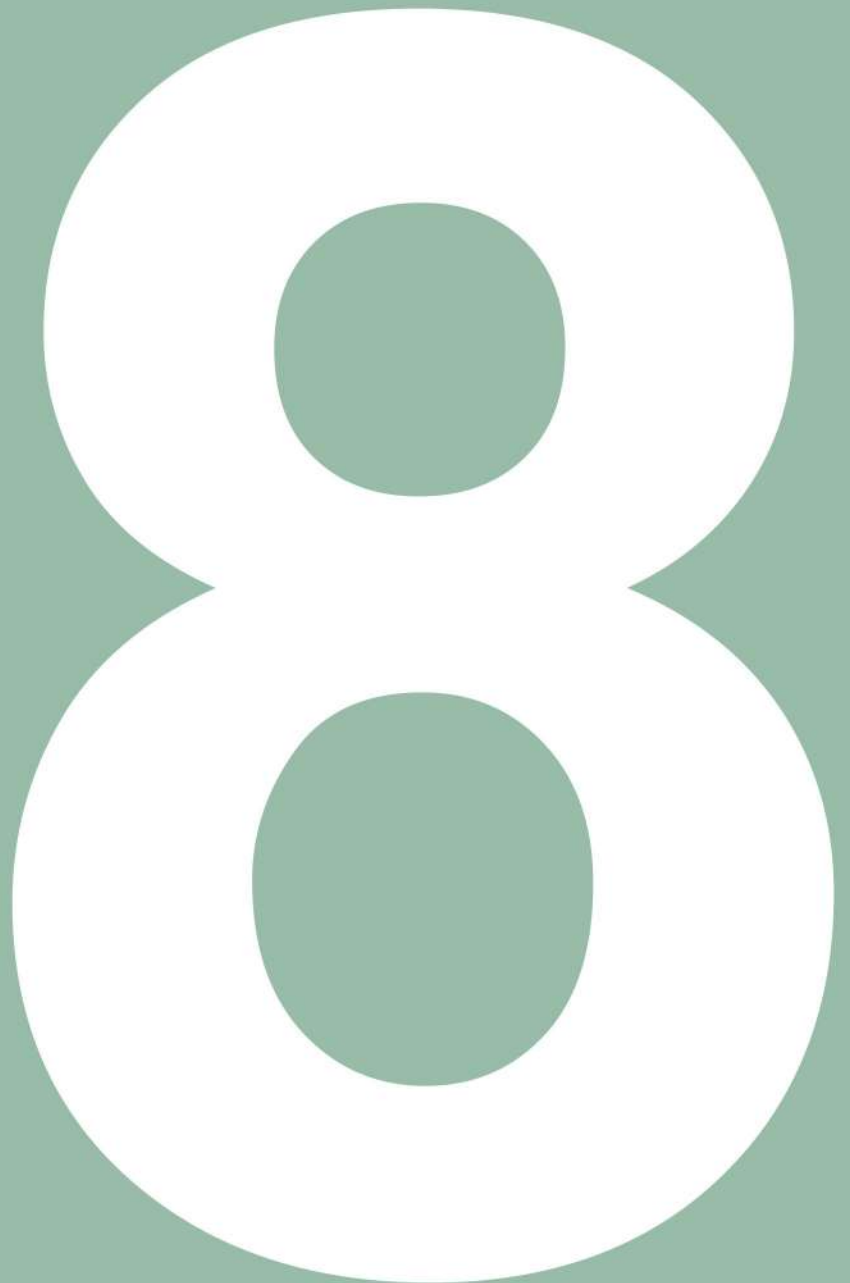
Table 7.11: Summary of Effects: *Air Quality*

DESCRIPTION OF IMPACT	GEOGRAPHICAL IMPORTANCE	RECEPTOR SENSITIVITY	MAGNITUDE	IMPACT BEFORE MITIGATION				MITIGATION	IMPACT AFTER MITIGATION (RESIDUAL)			
				ADVERSE/BENEFICIAL	REVERSIBLE/IRREVERSIBLE	SHORT-TERM/LONG TERM	SIGNIFICANCE		ADVERSE/BENEFICIAL	REVERSIBLE/IRREVERSIBLE	SHORT-TERM/LONG TERM	SIGNIFICANCE
Impact of Construction Dust and PM ₁₀	Loc	Medium	Medium-low	Adv	Reversible	ST	Mod	Measures included within CEMP includes - Sheetting of loose aggregates; use dust suppression tools; regular inspection and cleaning of local highways; ensure all construction plant and equipment is well maintained; no unauthorised burning of materials on-site.	Adv	Rev	ST	Neg
Impact of Operational Traffic NO ₂ , PM ₁₀ and PM _{2.5}	Loc	High	Neg	Adv	Irrev	LT	Neg	Travel Plan, EV charging, cycle and pedestrian links, encourage use of alternative transport, connections to bus network.	Adv	Irrev	LT	Neg
New Exposure NO ₂ , PM ₁₀ , PM _{2.5}	Loc	High	Neg	Ben	Irrev	LT	Neg	N/A.	Ben	Irrev	LT	Neg

Key

Loc: Local Med: Medium Ben: Beneficial Irrev: Irreversible LT: Long Term
Neg: Negligible Mod: Moderate Adv: Adverse Rev: Reversible ST: Short Term

Ecology



8.0 Ecology

Introduction

- 8.1 This chapter addresses the ecological impacts of the Proposed Development and has been prepared by Harris Lamb Property Consultancy (HLPC). This chapter is based on details set out in Chapter 1 and Chapter 4 of the ES [and its Addendum](#).
- 8.2 In accordance with the EIA Regulations (2017) the Ecological Assessment and ES chapter have been carried out by competent experts, comprising ecologists within the Chartered Institute for Ecology and Environmental Management (CIEEM).
- 8.3 This chapter is supported by the following appendices:
- **Appendix 8.1a** Copies of Scoping Correspondence
 - **Appendix 8.1b** Preliminary Ecological Appraisal (PEA)
 - **Appendix 8.2** Target Notes and Site Photographs
 - **Appendix 8.3** Habitat Suitability Calculation
 - **Appendix 8.4** Confidential Badger Survey
 - **Appendix 8.5** Draft Biodiversity Metric
 - **Appendix 8.6A** [Breeding Bird Survey](#)
 - **Appendix 8.7A** [Hazel Dormice Report](#)
 - **Appendix 8.8A** [Date, Weather Conditions and Timing of Bat Static Recorder Survey](#)
- 8.4 This Ecological Impact Assessment (EclA) identifies potential ecological constraints to the Proposed Development and indicates where avoidance and mitigation measures are necessary. It also identifies opportunities for ecological enhancement to the Site.

Potential Impacts

- 8.5 The Proposed Development has the potential to affect ecology through temporary and permanent loss of habitats which support a range of protected species. Timing of construction has the potential to affect protected species without additional precautionary mitigation measures implemented. The Proposed Development has been designed in consultation with ecologists to design out impact as far as practicable and to leave the biodiversity value of the Site in a measurably better condition over the medium to long term.
- 8.6 HLPC contacted ECC to agree the scope of the ecological survey in February 2021. No consultation response relating to ecology was provided at the time of writing this report. A copy of the request has been provided in **Appendix 8.1a** [of the original ES](#).
- 8.7 The Essex Biodiversity Validation Checklist (Essex County Council, June 2015) was completed as part of the scoping exercise. In compliance with the checklist, a Preliminary Ecological Appraisal was undertaken for Stage 1 (**Appendix 8.1b** [of the original ES](#)) which formed the basis of the scope of the following assessment in the absence of feedback from the scoping exercise.

- 8.8 The Validation Checklist states “Where a formal Environmental Impact Assessment (EIA) is required under the EIA regulations, the Biodiversity Statement and Mitigation Plan should be incorporated in to the Ecology Chapter of the Environmental Statement”. Stage 3 of the checklist require sites, habitats and species evaluation and is included under the ‘Existing Baseline Conditions’ section within this chapter. Stage 4 of the checklist requires a Biodiversity Statement and Mitigation Plan with is set out within the ‘Predicted and Evaluation of Predicted Impacts’ and ‘Mitigation’ sections of this Chapter.

Methodology

- 8.9 An EcIA has been undertaken in line with current best practice guidance (CIEEM, 2018) and includes:
- A desk-based assessment to identify any records of protected and/or notable habitats and species, and designated nature conservation sites in the vicinity of the Site;
 - A Site survey comprising an Extended Phase 1 habitat survey including the recording of any evidence of the presence of protected, priority and/or Invasive Non-Native Species (INNS);
 - An assessment of the potential impacts of the works on the habitats and species present at the Site and the surrounding areas;
 - The design of suitable mitigation and avoidance measures to ensure ecological impacts are kept to a minimum and proposals for suitable enhancement measures; and
 - The Ecological Assessment is based on a search for existing information combined with field surveys. The different elements are discussed below.

Desk-Based Assessment

- 8.10 The desktop study was undertaken in September 2020 and included:
- Essex Wildlife Trust Biological Record Centre (EWTBRC);
 - Multi Agency Geographic Information for the Countryside (MAGIC) website¹;
 - Ordnance Survey (OS)²; and
 - Aerial imagery⁶.
- 8.11 The geographical extent of the search area for biodiversity information was related to the significance of sites and species and potential zones of influence which might arise from development within the Site. For this Site, the following search areas were considered to be appropriate:
- 10km around the Site boundary for sites of International Importance (e.g. Special Area of Conservation (SAC), Special Protection Area (SPA), Ramsar site));
 - 2km around the Site boundary for sites of National or Regional Importance (e.g. Sites of Special Scientific Interest (SSSI)), protected or otherwise notable species and non-statutory designated sites of County Importance (e.g. LWS);
 - 1km for ancient woodland; and
 - 2km for biological records.
- 8.12 The relative proximity and/or accuracy and age of records for protected and notable species were considered during the appraisal to assist in determining the potential impact of the

1 www.magic.gov.uk accessed September 2020

2 www.bing.co.uk accessed September 2020

Proposed Development on these key ecological components.

- 8.13 No previous ecological information relating to the Site was identified. However, a review of an Ecological Appraisal of an adjacent residential scheme (ref: UTT/13/3467/OP ‘*outline planning permission comprising the erection of 200 dwellings of mixed size and tenure, including link road, residential access roads, public open space, surface water attenuation areas and landscaping, and access to and preparation of land for a one form entry primary school*’) by First Environmental Consultants Ltd in 2016 was undertaken to provide wider understanding of the ecological value of the area.

Field survey

Flora

- 8.14 HLPC carried out an initial Extended Phase 1 Habitat Survey of the Site in September 2020 which informed the PEA (**Appendix 8.1b of the original ES**) and was updated in May and June 2021. The survey was carried out by an experienced and suitably qualified ecologist and a full member of CIEEM. The survey was undertaken in accordance with ‘Extended Phase 1’ Methodology (JNCC, 2010).
- 8.15 Specific habitat features were mapped using Target Notes (TN) to record ecological features of particular note, where necessary.
- 8.16 Based on the habitats present on-site and within the immediate area, surveys for the following species/species groups were undertaken:
- Amphibians;
 - Badgers;
 - Bats (foraging and roosting)
 - Breeding Birds; and
 - Hazel dormice.

Fauna

- 8.17 The fauna included within this assessment is based on the habitats present, data from the desk-based searches, and the following legislation:
- Wildlife and Countryside Act 1981 (as amended);
 - The Protection of Badgers Act 1992;
 - The Conservation of Habitats and Species Regulations 2017 (as amended);
 - The NERC Act 2006 – S41 Species of Principal Importance (SPI) for the conservation of biodiversity; and
 - The Countryside Rights of Way Act 2000.

Amphibians

- 8.18 Waterbodies within 250m of the Site boundary were identified using online Ordnance Survey maps and aerial imagery³ and were assessed, for their suitability to support great-crested newts *Triturus cristatus* using a Habitat Suitability Index (HSI). The HSI is a numerical index, between 0 and 1. Values close to 0 indicate unsuitable habitat, 1 represents optimal habitat (Oldham *et al.*, 2000)⁴.

³ www.bing.com/maps accessed September 2020

⁴ Oldham *et al.*, 2000. Evaluating the suitability of habitat for the Great Crested Newt (*Triturus cristatus*).

Reptiles

- 8.19 An assessment of the suitability of the habitats present to support common reptile species was undertaken. In accordance with current guidance, this assessment involved a review of habitats and habitat structure for suitable shelter for reptiles such as areas of scrub and woodpiles, grassland with well-developed and varied structure, areas suitable for basking, large tussocks etc.

Birds

- 8.20 Bird species identified at the time of survey were noted and nesting birds recorded as seen. An assessment of habitats was undertaken to determine the likely value to breeding and foraging birds.
- 8.21 ~~At the time of writing this chapter, a Breeding Bird Survey had been commissioned and the results will be presented as an Addendum to this ES, post submission of the planning application.~~ A breeding bird survey was commissioned and undertaken by Falco Ecology. A copy of the report including full details of methodology is provided in **Appendix 8.6A**.

Bats

- 8.22 Trees were assessed externally from ground level with the use of torch and binoculars, where required by a licensed bat ecologist, James Patternden (Class 2 licence number 2015-106-CLS-CLS and Bat Low Impact Class Licence RC162, Annex B and D), and supported by consultant ecologist, Josh Randhawa in May 2021. During the survey, Potential Roosting Features (PRF) for bats following current best practice^{5, 6, 7} were recorded and trees considered to have bat roost potential identified for additional survey.
- 8.23 The potential for the Site and immediate surrounds to support foraging and commuting bats was also assessed in May 2021, with particular regard given to the presence of continuous treelines

5 Herpetological Journal 10, 143-155
Bat Conservation Trust (BCT) 2016. Bat Surveys for Professional Ecologists, Good Practice Guidelines, 3rd Edition

6 Mitchell-Jones, A.J. & McLeish, A.P. Ed. 2004. Bat Workers' Manual 3rd Edition

7 BCT (2015) Surveying for Bats in Trees and Woodland – Guide

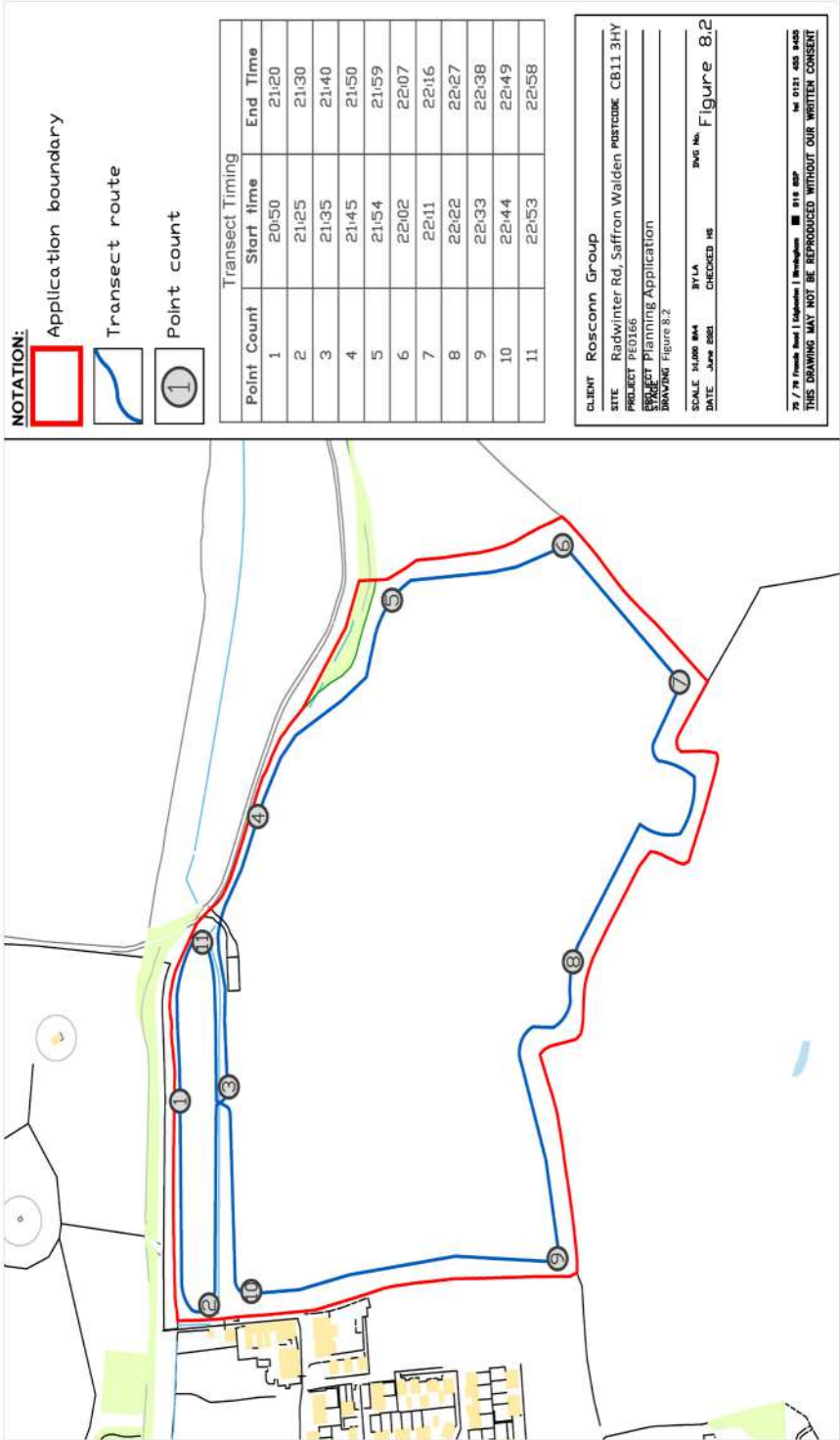


Figure 8.1A: Bat Transact Map

providing good connectivity in the landscape, and the presence of varied habitat such as scrub, woodland, grassland in the vicinity. This assessment identified further surveys to determine the value of the Site for foraging/commuting bats.

Nocturnal Activity Survey

- 8.24 A dusk emergence bat survey was undertaken on an oak tree (T5) with high bat roost potential along the northern Site boundary, which followed methodologies contained within BCT guidelines. The surveyors were equipped with Echo Meter Touch recorders and positioned strategically around the trees to capture all possible access/egress points. ~~At the time of writing this chapter, a further two bat surveys are planned in July 2021 and will be reported in a separate Addendum to this ES.~~
- 8.25 The survey was undertaken by licenced bat ecologist, Josh Randhawa (Bat Class Licence WML-A34-Level 1, 2021-52114-CLS-CLS) and assistant, Louis Andrews. Dusk commenced 15 minutes prior to sunset and ceased 90 minutes after sunset. Dawn surveys commenced at least 90 minutes before sunrise and ceased at sunrise.
- 8.26 Two dusk emergence bat surveys (in addition to the survey undertaken on 25th May 2021) were undertaken on an oak tree (T5) with high bat roost potential along the northern Site boundary, which followed methodologies contained within BCT guidelines. The surveyors were equipped with Echo Meter Touch recorders and positioned strategically around the tree to capture all identified access/egress points. The surveys were undertaken by Josh Randhawa (Bat Class Licence WML-A34-Level 1, 2021-52114-CLS-CLS) with assistance from assistant Louis Andrews and Abigail Lloyd (all members of CIEEM). Dusk commenced 15 minutes prior to sunset and ceased 90 minutes after sunset.
- 8.27 Details on the survey timings and weather conditions are given in **Table 8.1A** below.

Table 8.1A: Weather Conditions During Nocturnal Bat Activity Surveys

DATE	SUNSET (H)	START TIME (H)	END TIME (H)	AIR TEMPERATURE	WEATHER
25.05.2021	21:28	21:15	23:00	15oC	Clear, still, dry
13.07.2021	21:14	21:10	22:44	17oC	Clear, very mild, very little breeze and dry.
24.08.2021	20:04	19:49	21:34	16oC	Dry, 10% cloud cover, still

Transect Survey

- 8.28 A bat transect survey per season was considered appropriate in accordance with methodologies contained within Collins, 2016. At the time of writing this chapter, the May 2021 bat transect survey had been completed with further surveys planned in July and September 2021, which will be reported under a separate Addendum to this ES. Surveys involved taking acoustic bat recordings across a pre-determined transect route (see **Figure 8.1A**).

- 8.29 Surveys targeted habitat and features suitable for foraging/commuting bat activity, including the edges of woodland and hedgerows established along the Site boundaries.
- 8.30 The survey observed nocturnal bat activity at suitable points along the transect route and targeted the above interest features. The surveyor was equipped with an Echo Meter Touch recorder. The transect route was walked at a steady pace, during which time all visual and audible bat activity was recorded. The survey commenced prior to sunset and ceased approximately 90-120 minutes following sunset.
- 8.31 A walked bat transect survey was undertaken in July and September 2021 together with the survey in May 2021. Surveys involved taking acoustic bat recordings across a pre-determined transect route (see **Figure 8.2A**).
- 8.32 Surveys targeted habitat and features suitable for foraging/commuting bat activity, including the edges of woodland and hedgerows established along the Site boundaries.
- 8.33 The survey observed nocturnal bat activity at suitable points along the transect route and targeted the above interest features. The surveyor was equipped with an Echo Meter Touch recorder. The transect route was walked at a steady pace, during which time all visual and audible bat activity was recorded. The survey commenced prior to sunset and ceased approximately 90-120 minutes following sunset.
- 8.34 The date, timings and weather conditions during the surveys are given in **Table 8.2A** below and were considered optimal for capturing nocturnal bat activity. Details of static detector installations are provided in **Appendix 8.8A**.

Table 8.2A: Date, Weather Conditions and Timing of Bat Transect Survey

DATE	SUNSET (H)	START TIME (H)	END TIME (H)	AIR TEMPERATURE	WEATHER
25.06.2020	21:05	20:50	23:00	12°C	Dry, still, 20% cloud
13.07.2021	21:14	21:10	23:00	17°C	Clear, very mild, very little breeze and dry.
02.09.2021	19:44	19:30	21:30	18°C	Clear, very mild, very little breeze and dry.

Badgers

- 8.35 A badger *Meles meles* survey was conducted in April 2021 of the Site, and where accessible, up to 30m from the Site boundary. In addition to the presence of active setts, the following signs of activity were also searched for: latrines, footprints, evidence of feeding activity and well-worn paths through vegetation. Badgers will use a number of setts throughout their territory at different times of the year; any large holes with the potential to be used by badger, but not showing any obvious signs of recent activity, were therefore also recorded. Full survey results are provided in a separate confidential appendix (**Appendix 8.4 of the original ES**).

Hazel Dormice

- 8.36 Habitats present on-site were assessed for their suitability to support hazel dormice *Muscardinus avellanarius*. They are typically found in deciduous woodland, species-rich

hedgerows and scrub; with hazel, oak, bramble and honeysuckle being of particular importance to this species. Field signs were searched for by a licensed hazel dormouse ecologist to determine whether the habitats on-site were considered suitable for supporting this species.

- 8.37 In April 2021, 85 dormouse nest tubes were installed in hedgerows around the Site by Natural England licensed dormouse ecologist James Patternden. ~~At the time of writing this chapter, dormouse tubes had been checked on 24th May 2021 and no signs of hazel dormouse recorded. Surveys will continue until October 2021 and full results reported in an Addendum to this ES.~~

- 8.38 In addition to the assessment of habitats for suitability to support hazel dormice, a hazel dormice survey was commissioned and undertaken by Cotswold Ecology. A copy of the report with methodology is provided in **Appendix 8.7A**.

Otter and Water Voles

- 8.39 An otter and water vole survey was undertaken in September 2020, following principles set out in RSPB (1994) and Chanin (2003). Where access to the watercourse was possible, a check for evidence of water vole *Arvicola amphibius* was carried out following the 'search for field signs' method set out in Dean et al. (2016). The most important diagnostic field sign for water voles is the presence of latrine sites. These are locations repeatedly used by water voles to deposit their droppings, often in prominent locations along the bank. Other field signs include the presence of burrows, feeding sites and footprints. Although these other signs provide indication of presence and are useful supporting evidence to latrines, they are of limited value on their own. Signs of otter presence include spraints on prominent locations e.g. boulders, culverts etc, prints, holts, lay-ups, couches etc.

White-Clawed Crayfish

- 8.40 A ditch was present within the Site. The ditch was appraised for its suitability to support white clawed crayfish *Austropotamobius pallipes* and any signs of activity seen recorded from bankside access.

Legally Controlled Species

- 8.41 Evidence of species listed on Schedule 9 of the Wildlife and Countryside Act (1981), as amended, were recorded as seen.

Other

Methods of Assessment

Nature Conservation Evaluation

- 8.42 This section evaluates the nature conservation importance of the Site in terms of its relative importance in a geographical context.
- 8.43 The nature conservation sites, habitats and species that have been identified as important ecological features have been evaluated based on the criteria given in **Table 8.3A**. The importance of the feature is defined with reference to the geographical context of the Site i.e. the specific importance of the Site to each of the habitats or species populations identified as being present within it or making use of it.
- 8.44 Individual ecological receptors (habitats and species that could be affected by the Proposed Development) were assigned levels of importance for nature conservation in one of the following categories:

- International;
- UK;
- National;
- County;
- District;
- Local; or
- Within the immediate zone of influence only which is considered to be Site level.

8.45 For a given receptor, determination of value includes consideration of the size, conservation status and quality of the species, population or habitat feature.

Valuation of Habitats

8.46 Some sites are automatically assigned a nature conservation value through designation. The reason for designation is taken into account in assessing potential impacts. Designated sites are considered at the following levels:

- International – SAC, SPA and Ramsar Sites;
- National – SSSI in England; and
- County or District – sites designated by Local Authorities or County Wildlife Trusts and others.

8.47 The reason for designation is taken into account in assessing potential impacts. Habitats that are not subject to specific nature conservation designations have been valued against habitats included in the Section 41 list (list of species and habitats of principal importance in England) as required under Section 41 of the Natural Environment and Rural Communities [NERC] Act, 2006.

8.48 In determining values of habitats, consideration has also been given to national and local Habitat Action Plans and the Ancient Woodland Inventory (AWI). This consideration has been given in conjunction with critical appraisal of the size, status and quality of the habitat affected.

Valuation of Species Populations

8.49 In ascribing values to populations of species, consideration has been given to the legal status of species, as well as their population size and conservation status on the Site and within the geographic area. Certain species receive protection under various pieces of legislation and this has been taken into account when determining value. Legislation considered includes:

- Wildlife and Countryside Act 1981 (as amended);
- The Protection of Badgers Act 1992;
- The Conservation of Habitats and Species Regulations 2017 (as amended);
- The NERC Act 2006; and
- The Countryside and Rights of Way (CROW) Act 2000.

8.50 The rarity of the species in the context of status, i.e. whether populations of a species are declining either nationally or at a more local level has also been considered.

8.51 The presence of invasive alien species or injurious weeds is considered to represent an ecological dis-benefit.

Method of Impact Assessment

8.52 The assessment of ecological impacts has been undertaken following current best practice provided by the CIEEM, 2018.

8.53 This assessment identifies the potential effects of the Proposed Development on biodiversity within the Site boundary and wider Zone of Influence extending upto 10km from the Site depending on the type of impact and ecological feature under consideration. It determines the significance of the identified effects for the construction and operational phases.

8.54 Ecological features include nature conservation sites, habitats, species assemblages/ communities or populations or groups of species. The assessment of the significance of predicted impacts on ecological features is based on both the 'importance' of a feature and the nature and magnitude of the impact that the project will have on it. Impacts may be direct (e.g. the loss of species or habitats), or indirect (e.g. effects due to noise, dust or disturbance). 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;
- Identifying appropriate compensation measures to offset residual effects; and
- Identifying opportunities for ecological enhancement.

8.55 The assessment includes potential impacts (direct, indirect, secondary and cumulative) on each ecological feature determined as important from all phases of the project and describes in detail the impacts that are likely to be significant, making reference to the following characteristics as set out in CIEEM (2018):

- Positive or negative;
- Extent;
- Magnitude;
- Duration;
- Timing;
- Frequency; and
- Reversibility.

8.56 The key sources of impact to the nature conservation interests of the area resulting from the implementation of the Proposed Development may arise as direct and indirect effects, examples of which are given below:

Direct Effects:

- Direct mortality as a result of construction activity;

- Habitat loss (land-take), where the severity of impact is directly related to the amount of habitat lost and the conservation value of that habitat; and
- Habitat fragmentation (severance of habitats and/or wildlife corridors linking them). This can lead to reduced genetic diversity and increase the likelihood of species being lost.

Indirect Effects:

- Including disturbance (visual, noise or vibration), dust deposition, incidental vehicle trafficking, water discharges and surface runoff. These impacts may affect habitats both within and outside the footprint of the Proposed Development; and
- Impacts may be either temporary or permanent in nature. Temporary effects typically occur during the construction phase of a scheme. It should be appreciated that temporary impacts on habitats of high ecological value may have as great or greater impact as permanent loss of less valuable habitats.

8.57 The magnitudes of impacts are evaluated in terms of their predicted effect on the integrity of an ecological receptor, where integrity is defined as “The coherence of ecological structure and function that enables the feature to be maintained in its present condition.” (IEEM, 2006). Consideration is given to the nature and duration of the disturbance, its reversibility, timing and frequency, as well as any cumulative effects and the potential for impact avoidance or minimisation.

Defining Significance

8.58 After assessing the impacts of the proposal, all attempts should be made to avoid and mitigate ecological impacts. Once measures to avoid and mitigate ecological impacts have been finalised, assessment of the residual impacts are undertaken to determine the significance of their effects on ecological features (CIEEM, 2018).

8.59 For the purpose of EclA, ‘significant effect’ is an effect that either supports or undermines biodiversity conservation objectives for ‘important ecological features’ or for biodiversity in general. Conservation objectives may be specific (e.g. for a designated site) or broad (e.g. national/local nature conservation policy) or more wide-ranging (enhancement of biodiversity). Effects can be considered significant at a wide range of scales from international to local (CIEEM, 2018).

8.60 Significant effects encompass impacts on the structure and function of defined sites, habitats or ecosystems and the conservation status of habitats and species (including extent, abundance and distribution). Significant effects are qualified with reference to a geographic scale; European, national, regional, county, district, local and site (CIEEM, 2018).

8.61 For the purposes of the EIA Regulations, effects at a district or above level are generally considered to be ‘significant’ under the Regulations, unless otherwise stated.

8.62 **Table 8.3A** shows the factors that have been considered in the determination of significant effects on ecological features.

Table 8.3A: Determining Ecologically Significant Effects

ECOLOGICAL FEATURE	CONSIDERATION
Designated sites	<p>Will the project undermine the site's conservation objectives?</p> <p>Will the project positively or negatively affect the conservation status of habitats or species for which the site is designated?</p> <p>Will the project have positive or negative effects on the condition of the Site or its interest/qualifying features?</p> <p>Will the project remove or change any key characteristics?</p> <p>Will there be an effect on the nature, extent, structure and function of component habitats?</p> <p>Will there be an effect on the average population size and viability of component species?</p> <p>Will there be an impact on wider ecosystem functions and processes?</p>
Habitats	<p>Will the project positively or negatively affect the conservation status of the habitat?</p> <p>Will it affect its extent, structure and function as well as its distribution and its typical species within a given geographical area?</p>
Species	<p>Will the project positively or negatively affect the conservation status of the species?</p> <p>Will it affect its abundance and distribution within a given geographical area?</p>

Cumulative Effects

- 8.63 A search of the LPA online planning portal was checked for any relevant plans or projects with the potential to act in-combination with the Proposed Development which could increase the impact on the Site's biodiversity. This included consideration of those development commitments already screened as part of the project's Cumulative Impact Assessment, as outlined in more detail in Chapter 14 of the ES [and this Addendum](#).

Assessment Limitations and Assumptions

- 8.64 The assessment for designated sites is based on site citations provided by the local biological record holder and no visits have been made to designated sites.
- 8.65 Ecological surveys are limited by factors that affect the presence of plants and animals, such as the time of year, weather, migration patterns and behaviour. The initial survey was undertaken in September, which is towards the end of the growing season, it was still possible to characterise the habitats present and this assessment was updated during subsequent Site visits in May and June and, therefore, not considered to be a significant limitation.
- 8.66 The Phase 1 Habitat Survey aimed to characterise the habitat on-site and is not intended to give a complete list of plant species present. All surveys capture a snap shot of data recorded on the day.
- 8.67 Any absence of desk study records cannot be relied upon to infer absence of a species/habitat, as the absence of records may be a result of under-recording within the given search area.
- 8.68 Some areas of vegetation adjacent to the Site were dense bramble, hindering full access during the badger survey. It was considered that sufficient access was possible to characterise the Site's value to badgers.

- 8.69 Due to dense vegetation, some areas of the ditch bankside were not fully visible or accessible for water vole and otter survey. Access was sufficient to characterise the likely value of the watercourse for riparian mammals and white-clawed crayfish. It was considered that sufficient access was possible to characterise the Site's value to water voles, otters and white-clawed crayfish.
- 8.70 Access to trees was limited particularly along Radwinter Road making assessment of bat roost potential limited in some places. It was considered that sufficient access was possible to characterise the Site's value to bats.

Existing Baseline Conditions

Baseline data

Internationally Designated Sites for Nature Conservation

- 8.71 No internationally designated sites for nature conservation were identified within 10km of the Site.

Nationally Designated Sites for Nature Conservation Designation

- 8.72 No nationally designated sites for nature conservation were recorded within 2km of the Site.

Non-Statutorily Designated Sites for Nature Conservation Designation

- 8.73 Ten non-statutorily designated sites were identified within 2km of the Site (**Table 8.4A**). None were recorded on-site. The closest site identified is Pounce Wood LWS located c. 180m north, separated by Radwinter Road.

Table 8.4A: Non-Statutorily Designated Sites Identified within 2km of the Site

NAME OF SITE	APPROX. DISTANCE AND DIRECTION FROM THE SITE	BRIEF DESCRIPTION
Pounce Wood	180m north	This large ancient wood has been almost entirely replanted with beech <i>Fagus sylvatica</i> , spruce <i>Picea</i> sp. and other conifers. Supports marshy grassland flora, including wood sedge <i>Carex sylvatica</i> and remote sedge <i>Carex remota</i> .
Ashdon Road Verges	500m north	Verges supporting chalk grassland flora.
Martin's Wood	650m north-east	Ancient woodland dominated by conifers. Native broadleaved species are largely restricted to the boundary banks. Supports interesting ground flora and marshy grassland habitat.
Whitehill Wood	700m north	Ancient woodland although most of the wood has been replaced by conifers. Supports the nationally scarce wood barley <i>Hordeum europaeus</i> .
Saffron Walden - Ashdon Road Protected Roadside Verge	700m north	Verges supporting chalk grassland flora.
Robin's Grove/Hills Wood	1km north-east	Two ancient woodlands restocked with conifers. Native species are varied but sparse.

NAME OF SITE	APPROX. DISTANCE AND DIRECTION FROM THE SITE	BRIEF DESCRIPTION
Mollpond Wood	1km north	Ancient wood comprises tree-sized coppiced hornbeam <i>Carpinus betulus</i> and pedunculate oak <i>Quercus robur</i> standards. The ground flora has an unusual abundance of sedges.
Redgates & Noakes Grove	1.15km north-east	Flower-rich chalky grassland with scrub. The main species of interest is the large population of Wild Liquorice <i>Astragalus glycyphyllos</i> .
Redgates Lane	1.4km north-east	Road verge, hedge and immediate inner field margin. Supports nationally scarce crested cow-wheat <i>Melampyrum cristatum</i> .
Wimbish Lanes	1.7km south-east	This network of ancient green lanes provides linear woodland and grassland habitats which attract a wide range of wildlife, notably butterflies, and acts as a valuable wildlife corridor system in a largely arable landscape.

- 8.74 These sites are considered to be of importance to nature conservation up to a district to county level.

Priority Habitat

- 8.75 There are two priority habitats within 2km of the Site boundary: traditional orchard and deciduous woodland. The traditional orchard is c. 0.34ha in extent and located c. 550m west of the Site. The areas of deciduous woodland include Ancient Semi-Natural Woodlands (ASNW) and Ancient Replanted Woodland (ARW). The Pounce Wood (ARW) is located c. 180m north of the Site and Whitehill Wood (ARW) located c. 700m north of the Site. Martins Wood (ASNW) is located c. 650m north-east of the Site. These sites are considered to be of importance to nature conservation up to a district to county level.

Habitats on Site

- 8.76 The habitats described below are mapped in **Figure 8.2A** with Target Notes (TN) and Site photographs provided in **Appendix 8.2** of the original ES.

Arable

- 8.77 The majority of the Site consists of an arable field dominated by bare ground at the time of survey with areas of tall ruderal habitat in the field margin (c. 1m wide). Species recorded include perennial ryegrass *Lolium perenne*, yarrow *Achillea millefolium*, broad-leaved dock *Rumex obtusifolius*, spear thistle *Cirsium vulgare*, common nettle *Urtica dioica* and creeping thistle *Cirsium arvense*.

- 8.78 This habitat is considered species poor and widespread both locally and nationally and is not considered to be of value to nature conservation at greater than a Site level.

Semi-Improved Grassland

- 8.79 The smaller field was dominated by grasses which appeared to have been sown in the past with perennial ryegrass *Lolium perenne*. Species recorded include, fescue *Festuca sp.*, cock's-foot *Dactylis glomerata*, yarrow *Achillea millefolium*, broad-leaved dock *Rumex obtusifolius*,

broadleaved plantain *Plantago major*, false oat-grass *Arrhenatherum elatius*, white clover *Trifolium repens*, meadow foxtail *Alopecurus pratensis*, common nettle *Urtica dioica*, cow parsley *Anthriscus sylvestris* and cowslip *Primula veris*.

- 8.80 This habitat is considered to be widespread both locally and nationally and is not considered to be of value to nature conservation at greater than a Site level.

Hedgerows and Scattered Trees

- 8.81 The field boundaries are dominated by species-rich hedgerows with scattered mature and semi-mature trees (**Table 8.5A**). It is outside the scope of this assessment to value to hedgerows under the archaeology section of the Hedgerow Regulations 1997.

Table 8.5A: Summary of Hedgerows on Site (see Figure 8.2A for Locations)

HEDGEROW NUMBER	OBSERVATIONS	SPECIES RECORDED	POSSIBLE SPECIES-RICH UNDER HEDGEROW REGULATIONS 1997?
H1	c. 4m tall.	Blackthorn hazel, field maple, horse chestnut, dog rose, elder, hawthorn.	YES
H2	Hedgerow in double row.	Blackthorn hazel, field maple, horse chestnut, dog rose, elder, hawthorn, apple.	YES
H3	Hedgerow in double row.	Blackthorn hazel, field maple, horse chestnut, dog rose, elder, hawthorn, apple.	YES
H4	Hedgerow in part double row.	Blackthorn hazel, field maple, ash, dog rose, oak.	Possible
H5	Hedgerow in single row. Dry ditch. Dead tree with moderate bat roost potential (TN3).	Blackthorn hazel, field maple, horse chestnut, dog rose, elder, hawthorn, apple.	YES
H6	Hedgerow in single row becomes double at the end. Dry ditch. Dead tree with moderate bat roost potential (TN3).	Blackthorn hazel, field maple, horse chestnut, dog rose, elder, hawthorn, apple.	YES
H7	Hedgerow in double row but adjacent to property. Dry ditch.	Blackthorn hazel, field maple, horse chestnut, dog rose, elder, hawthorn, yew, holly. Leylandii.	No – curtilage of a property
H8	c. 4m tall.	Blackthorn hazel, field maple, horse chestnut, dog rose, elder, hawthorn.	YES

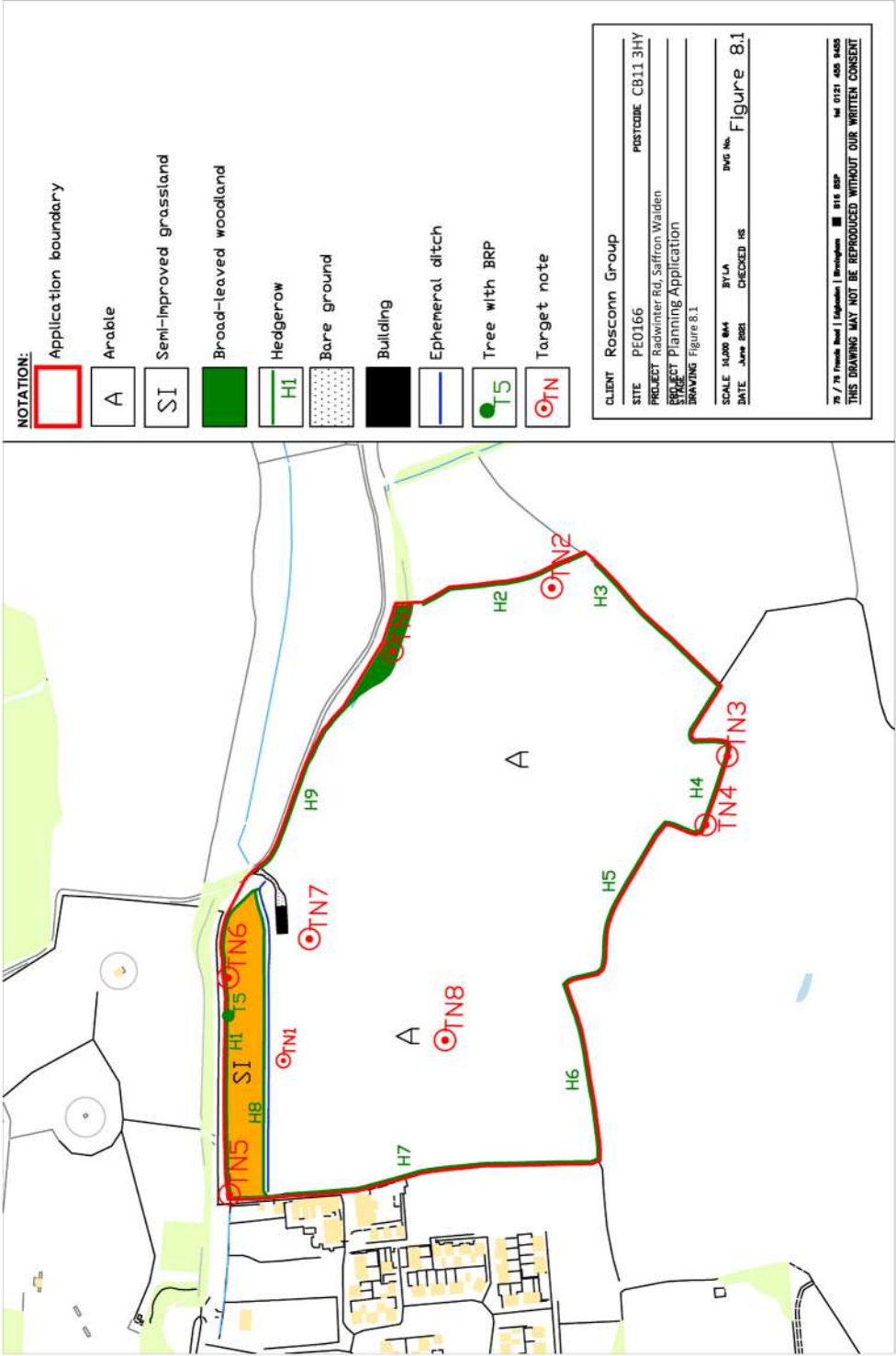


Figure 8.2A: Phase 1 Habitat Map

HEDGEROW NUMBER	OBSERVATIONS	SPECIES RECORDED	POSSIBLE SPECIES-RICH UNDER HEDGEROW REGULATIONS 1997?
H9	c. 4m tall.	Blackthorn hazel, field maple, horse chestnut, dog rose, elder, hawthorn.	YES

8.82 The hedgerows frequently support a range of broad-leaved trees ranging in age from immature to mature. Species include; oak *Quercus* sp., ash *Fraxinus excelsior*, field maple *Acer campestre*, sycamore *Acer pseudoplatanus*, horse chestnut *Aesculus hippocastanum* and goat willow *Salix caprea*.

8.83 Hedgerows and scattered trees are considered to be of importance up to a local level, primarily due to the species diversity and habitat connectivity they provide.

Watercourse

8.84 A ditch was present on Site which was partially dry at the time of survey. The ditch, c. 0.5m wide with vegetated bank sides, heavily shaded by dominated mature trees and hedgerow. The ditch appeared to be formed from a muddy substrate lacking frequent boulders and stones. The ditch is culverted under the access road. The ditch was dry in places and water did not have any visible flow.

8.85 It is considered likely to have been man-made or influenced and non 'near natural' as required by River and Stream Priority Habitats. It is considered to be of Site level importance to nature conservation.

Buildings

8.86 One building was present on-site; an agricultural shed constructed from metal panelling. The structure was considered to be of negligible value to nature conservation.

Species

Amphibians

8.87 No records of great crested newts within 2km of the Site were provided by EWTBRC.

8.88 One pond was identified within 250m of the Site located c. 170m to the south of the Site. Upon inspection, the pond was largely dry and filled with terrestrial plant species (see **Appendix 8.3** for HSI calculations) and was considered to offer poor suitability for great crested newts. Based on the lack of suitable breeding habitat identified within 250m of the Site, great-crested newts are not considered likely to be a receptor with respect to the Proposed Development of the Site and are scoped out of this assessment.

Reptiles

8.89 No records of reptiles within 2km of the Site were provided by EWTBRC.

8.90 The habitats on-site are considered to be suboptimal for supporting populations of reptiles due to the dominance of arable habitat. The Site is connected to wider environs for reptiles through hedgerows and the ditch appears to frequently lack water, but these habitats are considered to offer suboptimal habitat for reptiles. It cannot be entirely ruled out that reptile species may

be a receptor in respect of the Proposed Development and a precautionary approach is recommended and, therefore, reptiles have been scoped into this assessment.

Birds

- 8.91 Multiple records of bird species within 2km of the Site were provide by EWTBRC.
- 8.92 The habitats on-site are likely to provide suitable foraging and nesting habitat for a range of urban and agricultural bird species, particularly associated with the hedgerows and mature trees and arable habitat. Foraging and nesting birds could be a potential receptor with respect to the Proposed Development.
- 8.93 Based on the limited size of the Site and context of similar habitat immediately in the local landscape, the Site is considered to be of importance to foraging and nesting birds at a Site level.
- 8.94 **Appendix 8.6A** sets out the results of the breeding bird survey undertaken at the Site. A total of 31 species were recorded, of which 18 species were considered to be holding territory and potentially breeding on Site. Full species lists and distribution are provided in **Appendix 8.6A**. Species of conservation concern (Key Breeding Species) that were recorded holding territory and potentially breeding within the Site included Skylark (4 territories), Song Thrush (1 territory), Dunnock (1 territory) and Yellowhammer (2 territories). Overall the Site has a low variety of urban and farmland species including those which are considered as UK Red Listed on the Birds of Conservation Concern (BOCC) and are, therefore, of high conservation concern.
- 8.95 Taking into consideration the updated survey, the assessment baseline remains as mentioned above, where the habitats on Site are considered to be of importance to foraging and nesting birds at a Local level.

Bats

- 8.96 Bat species reported within 2km of the Site included common pipistrelle *Pipistrellus*, soprano pipistrelle *Pipistrellus pygmaeus*, noctule *Nyctalus noctule*, serotine *Eptesicus serotinus* and brown long eared *Plecotus auratus* bat.
- 8.97 The trees to be affected by the Proposed Development were based on the British Standard Tree report (B. J. Unwin Forestry Consultancy 2021). All trees to be affected by the proposed access were assessed by a licenced bat ecologist. Tree T5 (**Figure 8.2A**) is a large veteran oak (*Quercus* sp.) and has the following Potential Roosting Features (PRF) as shown in photographs in **Appendix 8.2 of the original ES**:
- A - Tear out, E aspect, 4m. Cavity appears to extend into branch and may be currently used by squirrels - Moderate;
 - B - 2 x Tear out, S aspect, 3m. Tear outs with possible cavities present - Moderate;
 - C - Splits and lifted bark associated with south facing branch at 10m - Moderate;
 - D - Ivy cover to 13m with thick matted stems that provide suitable crevices for roosting during the summer period - Moderate; and
 - E - Potential (likely) hidden features not able to be viewed from ground level due to foliage of Ivy and height and maturity of tree - High.

- 8.98 All other trees anticipated to be affected were considered to have low or negligible value for roosting bats. Several trees to be retained were assessed as having bat roost potential as shown on **Figure 8.2A** (TN3; TN4 and TN5) on the southern Site boundary.
- 8.99 T5 was subject to a dusk emergence survey and a bat was observed potentially emerging from T5 at 21:45 h on 25th May 2021, and commute southwards. The bat emerged silently but was considered to be a brown long-eared bat. A further two bat surveys are planned and full results will be provided as an Addendum to this ES to validate the current assessment findings. For the purpose of this assessment, T5 is considered to support a bat roost.
- 8.100 The hedgerow habitat corridors on-site are considered suitable for foraging/commuting bat species. The May 2021 bat transect survey recorded foraging and commuting bat activity throughout the survey, mainly associated with the boundary vegetation. Common pipistrelles were recorded most frequently with the majority of foraging activity recorded in proximity to the belt of woodland along the northern Site boundary. Four passes from barbastelle bats *Barbastella barbastellus* were recorded along the southern and western Site boundaries and one pass from a brown long-eared bat was recorded. ~~Further surveys are on-going and data will be provided as an Addendum to this ES.~~
- 8.101 ~~Foraging and roosting bats could be a potential receptor with respect to the Proposed Development. Based on the survey data collected to date, it is anticipated that the Site is likely to be of Site to local value to foraging/commuting bat species and Site-local value for roosting bats based on data to date.~~
- 8.102 The July 2021 transect survey identified similar levels of activity with foraging and commuting common and soprano pipistrelle bats being recording most frequently. Common pipistrelles were recorded most frequently with the majority of foraging activity recorded in proximity to hedgerow habitats. A single recording from a Natterer's bat *Myotis nattereri* and brown long-eared bat were identified during the survey visit. In addition, a few passes by noctule bat were recorded around 21:58 h. No barbastelle bat was recorded during this survey visit.
- 8.103 The September 2021 transect survey identified lower levels of activity with similar species recorded typically foraging associated with the hedgerow/boundary habitats.
- 8.104 T5 was subject to three dusk emergence surveys. During the first emergence survey on 25th May 2021, a bat was observed potentially emerging from the tree at 21:45 h and commuting southwards. The bat emerged silently but was considered to be a brown long-eared bat from visual identifiers. A further potential emergence from the same location on T5 was observed during the third bat survey at 20:47 h on 24th August 2021. The bat was confirmed as a brown long-eared bat from calls recorded and it was also observed commuting southwards after emerging. Therefore, it is considered that T5 supports a single brown long-eared bat day roost.
- 8.105 Taking into consideration the updated survey, the assessment of baseline value as mentioned above, is considered to remain appropriate where habitats recorded are considered likely to be of Site to Local value to foraging/commuting bat species and Site-Local value for roosting bats.
- Badger**
- 8.106 Information pertaining to badgers is provided under confidential **Appendix 8.4** of the original ES.
- Hazel Dormice**
- 8.107 No records of hazel dormice within 2km of the Site were provided by EWTBRC.

8.108 The hedgerows on-site were considered in places to provide the required structural diversity to support hazel dormice. No records of this species are known in the area, however, due to potentially suitable habitat it cannot be entirely ruled out this species is a potential receptor with respect to the Proposed Development.

8.109 ~~Surveys are ongoing to determine presence/absence of hazel dormice. At the time of writing this chapter, no hazel dormice had been recorded in the May 2021 survey visit. Further surveys are planned until October 2021. It is anticipated that, based on the habitat connectivity the hedgerows on-site provide, that should hazel dormice be present the Site habitats would be of local value for this species. Taking a precautionary approach, this assessment assumes the presence of hazel dormice.~~

8.110 **Appendix 8.7A** sets out the results of the hazel dormice survey. In summary, no hazel dormice were recorded during the survey and, therefore, impacts to hazel dormice have been scoped out of further assessment.

Otter and Water Vole

8.111 No records of water vole or otter within 2km of the Site were provide by EWTBRC.

8.112 The watercourse, c. 0.5m wide with vegetated bank sides, heavily shaded by dominated by mature trees and hedgerow. The ditch appeared to be formed from a muddy substrate lacking frequent boulders and stones. The ditch is culverted under the access road. The ditch was dry in places and water did not have any visible flow.

8.113 No signs of water vole or otter activity was recorded during the survey. The ditch is considered suboptimal for both species due to lack of foraging habitat for water vole and shelter for otters. Taken together with the lack of records in the area, it is considered unlikely that otter and water vole are receptors with respect to the Proposed Development. Given these species are highly mobile and conditions of the ditch may alter to support water, a precautionary approach has been adopted, therefore, water vole and otter have been scoped into the assessment.

White-Clawed Crayfish

8.114 No records of white-clawed crayfish within 2km of the Site were provide by EWTBRC.

8.115 The ditch lacked water in many areas and was formed from a muddy substrate lacking frequent boulders and stones. Taken together with the lack of records for this species in the area, it is considered unlikely that white-clawed crayfish is a receptor with respect to the Proposed Development.

Other Notable Species

8.116 Hedgehogs have been recorded within 2km of the Site. The habitats on the Site are suitable for supporting this species and hedgehogs are considered a potential receptor with respect to future development.

8.117 The Site has the potential to support brown hare *Lepus europeaus*. Brown hares rest and rear young in depressions in arable fields; habitat of this kind is present across the Site. The Site is predominantly arable fields and field margins and hedgerows may also provide cover, particularly in winter months. No specific survey for brown hare was undertaken during this assessment and no incidental sightings were made. Given the availability of suitable arable habitat in the wider landscape, the Application Site represents only a small fraction and is considered to be of importance to brown hare at a Site level only.

- 8.118 The habitats on-site were assessed for their potential to support diverse populations of important and protected terrestrial invertebrates. The habitats on-site are common and widespread both in the wider landscape and across the UK. Habitats typically considered of high value to invertebrates including deadwood, wetland and significant expanses of brownfield are not present on-site. As such, the Site is considered to support a range of common invertebrate species only and is not considered to be of importance to invertebrates at more than a Site level.

Invasive Non-native Species.

- 8.119 No invasive species were identified on-site at the time of survey and further assessment has been scoped out.

Evolution of the Baseline Conditions Without Development

- 8.120 As required by Schedule 4 of the 2017 EIA Regulations, the ES must contain an outline of the likely evolution of the baseline conditions without implementation of the development and to be *“As far as natural changes from the baseline scenario can be assessed with reasonable effort on the basis of the availability of environmental information and scientific knowledge.”*
- 8.121 The Site is an arable field and a grassland field surrounded by hedgerows under agricultural management. The evolution of baseline conditions is likely to be a continuation of this management and is not anticipated to benefit from habitat improvements that would be implemented via development, including net biodiversity gain, from positive habitat management and planting.

Predicted Impacts

Protected Sites

- 8.122 No internationally or nationally designated sites for nature conservation were identified within 10km or 2km of the Site respectively. No impacts direct or indirect to internationally or nationally designated sites for nature conservation are anticipated to occur.
- 8.123 The Proposed Development will introduce new residents into the local area. Pounce Wood LWS is located c.180m to the north of the Site and is in private ownership with no public or permitted rights of access. On this basis, no recreational impacts to Pounce Wood LWS are anticipated and this has been scoped out of further assessment.

Embedded Mitigation

- 8.124 The ecological components of the scheme are an important integral part of the proposals and any necessary mitigation measures have been designed into the Proposed Development as embedded (inherent) mitigation. Where additional mitigation is required it has been identified separately below. Embedded mitigation is predicted to have a positive direct impact over the short to long-term. The semi-natural greenspace, attenuation area and Public Open Space (POS) for the Site proposes a series of linked multi-functional spaces that will deliver landscape, amenity and biodiversity benefits as well as perform SuDS functions, responding to flood risk, pollution control and climate change issues.
- 8.125 Whilst this application is in outline with landscape detail reserved, green spaces of the Site can be seeded with locally appropriate seed mixes and managed for biodiversity enhancement. Hedgerows will largely be retained except for access and will be reinforced and new native tree planting will be implemented around Site boundaries, within hedgerows to provide a robust landscape structure and extend and link the existing habitat network. An initial DEFRA V2

Biodiversity Metric has been undertaken showing that based on the Parameter Plans submitted, Biodiversity Net Gain could be achieved subject to an appropriate final landscape planting scheme (**Appendix 8.5 of the original ES**). The Biodiversity Metric would need to be finalised at the reserved matters stage.

- 8.126 At reserved matters application stage, detailed planting and management plans will be prepared in response to suitably worded outline planning conditions, that will set out how the above embedded strategy will be delivered.

Habitats

- 8.127 Based on the assessment parameter plans, it is anticipated that the Proposed Development will have the following ecological impacts. Impacts to badgers are provided under a separate confidential report (**Appendix 8.4 of the original ES**), the assessment of effects are discussed in the following sections:

- Permanent loss of sections of species-rich hedgerow;
- Permanent loss of arable field;
- Permanent loss of semi-improved grassland;
- Creation of grassland for a variety of uses including semi-natural greenspace and public open space with wildlife-friendly mix and management regime to attain best possible condition;
- Enhancement of existing hedgerows and planting additional trees;
- Creation of mixed scrub habitat;
- Retention of existing hedgerows (except for access);
- Creation of standing water habitats via the attenuation SuDS scheme;
- Potential for disturbance to reptiles, if present during construction with long-term enhancement of reptile habitat;
- ~~Potential for disturbance to hazel dormice, if present during construction, with long-term enhancement of hazel dormice habitat;~~
- Potential for disturbance and loss of nesting and foraging habitat during construction with long-term enhancement of habitat for a range of urban and farmland bird species. Permanent loss of habitat for arable habitat dependent bird species such as skylark;
- Potential for disturbance to otters and water voles, if present during construction, with long term enhancement of habitat via the SuDS scheme;
- Potential disturbance to a brown-long eared bat roost in T5 via hedgerow removal/lighting;
- Enhancement of bat foraging/commuting habitat and roosting bat habitat;
- Potential for disturbance to hedgehogs, if present during construction, with long-term enhancement of hedgehog habitat;
- Permanent loss of potential brown hare habitat; and
- Potential enhancement of terrestrial invertebrate habitat.

Evaluation of Predicted Impacts.

Protected Sites

- 8.128 Without appropriate pollution prevention measures, there is a low risk that construction could indirectly affect nearby habitats including LWSs, therefore, any pollution events are not likely to be significant above Site level. As the nature and pathway of any such pollution event is hard to predict, confidence in this assessment is low.

Habitats

Arable Fields and Margins

- 8.129 Permanent loss of arable land and field margins will be required. Arable field margins are not considered to qualify as Priority Habitats due to the lack of width and management. Arable land and field margins are common in the landscape. Based on the availability of similar habitat in the landscape and low ecological value, permanent loss of an arable field is considered to be significant at a Site level only.

Semi-Improved Grassland

- 8.130 Permanent loss of semi-improved grassland will be required. The Proposed Development will create an attenuation area and semi-natural green space which, with the embedded mitigation as shown on the illustrative layout, is anticipated to enhance the biodiversity of the grassland habitats with an appropriate final species selection and management regime that is considered to be of significance at a Site level.

Species-Rich Hedgerows and Scattered Trees

- 8.131 Permanent loss of c. 105m of hedgerow H4 and c. 25m of hedgerow H3 (B. J Unwin Forestry Consultancy, 2021) will be required for access. These hedgerows correspond to H1 and H8 on the Phase 1 Habitat Map (**Figure 8.2A**) and based on an initial survey were considered to be potentially species-rich and 'important' under the Hedgerow Regulations. Hedgerows on-site are considered to qualify as Priority Habitat. Taking a precautionary approach based on the limited sections of permanent hedgerow removal required, taken together with the embedded hedgerow mitigation which retained hedgerow habitat connectivity, it is considered that the permanent loss of small sections of species-rich hedgerow (should an appropriate native species-rich mix not be implemented) could be negative (adverse), permanent and significant at a Site level.
- 8.132 Without appropriate further mitigation there is potential for indirect, negative and permanent impacts on retained species-rich hedgerows through soil compaction, accidental damage during construction which could be of significance at a Site level.
- 8.133 Based on the current Proposed Scheme, all trees are anticipated to be retained with additional native tree planting. Without appropriate mitigation there is potential for indirect, negative and permanent impacts on retained trees through soil compaction and accidental damage during construction which could be of significance at a Site level.

Watercourse

- 8.134 Based on the Proposed Development the existing ditch (watercourse) will be retained and no direct permanent impacts are proposed. The ditch did not hold water in many sections and lacked visible aquatic plants. It is not considered to qualify as a Priority Habitat. Without mitigation there is potential for direct impacts during construction such as pollution events or direct temporary impacts such as accidental incursions during construction. Any such impacts are considered to be temporary and reversible and of significance at a Site level.

- 8.135 The Proposed Development includes the creation of four new attenuation ponds located across the Site. The Proposed Development is considered likely to result in a direct positive and permanent enhancement of standing water habitat. Therefore, the Proposed Development will result in a net minor positive impact of significance at a Site level in terms of standing water habitat.

Building

- 8.136 Loss of a modern agricultural barn is considered to be of negligible impact to nature conservation. Impacts to protected species are considered below.

Reptiles

- 8.137 Native reptiles are protected against intentional killing and injuring under Schedule 5 of the Wildlife and Countryside Act 1981 (as amended). They are also all listed on Section 41 of the NERC Act.
- 8.138 Reptiles may be present at the time of construction. Based on the limited extent of suitable reptile habitat within the Site, the limited extent of the Site in the absence of mitigation construction impacts to reptiles (if present at the time of works) could be negative (adverse), permanent and significant up to a Local level.
- 8.139 There is also a likely minor beneficial impact to reptiles at a Site level (should a population be present) based on the embedded mitigation of creation of attenuation areas and enhancing habitat mosaic around the Site which populations of reptiles could benefit from over the medium to long term and significant at a Local level. Confidence in the assessment is low.

Birds

- 8.140 All nesting birds are protected under the Wildlife and Countryside Act 1981 (as amended) against destruction of the nest during the bird nesting season, which falls between March and August (inclusive). Bird species listed on Schedule 1 of the Act are afforded special protection against disturbance while at the nest or breeding site. Numerous bird species are listed on Section 41 of the NERC Act where they are in conservation decline.
- 8.141 During construction nesting (breeding) birds could be impacted by direct mortality and/or injury during construction if present at the time of vegetation removal or building demolition which without mitigation could negatively affect local populations of bird species. Based on the limited vegetation removal proposed, without mitigation it is not anticipated that this impact would be significant at greater than a Local level.
- 8.142 The Proposed Development will result in the permanent loss of agricultural habitats, permanent loss of sections of hedgerow for access, and temporary loss of semi-improved grassland all of which provide some foraging/nesting habitat for a range of agricultural bird species.
- 8.143 Embedded mitigation includes creation of grassland and strengthening hedgerow planting and additional tree planting and four new attenuation basins providing standing water habitat. Generalist species such as house sparrow and dunnock are likely to be positively impacted from increased nesting habitats (residential buildings and nest boxes) and food availability (garden bird feeders) which could result in a permanent positive impact for bird assemblages significant at a Local level.

- 8.144 Whilst loss of an arable field and field margins is likely to have a negative, permanent and irreversible impact on bird species which rely on arable crop rotation such as skylark, based on the small extent of the arable field present, the availability of arable habitat in close proximity and in the wider landscape, any such displacement is not considered to be significant at greater than a Local level. Based on data gathered to date, confidence on the bird assemblage to be affected is low.

Bats

- 8.145 All bats are European Protected Species. All species of bat are protected under the Conservation of Habitats and Species Regulations 2017 (as amended), and the Wildlife and Countryside Act 1981 (as amended), which provides protection to certain animals included in Schedule 5 of the Act. Under the Act (as amended) in summary it is an offence to intentionally or recklessly kill, injure, capture or disturb bats or to damage, destroy or obstruct access to any place used by bats for shelter or protection. This is irrespective of whether the animals are present.
- 8.146 The existing building will require demolition and was considered to have negligible bat roost potential. Without further mitigation bats could be impacted by direct mortality, injury or disturbance during construction, if present at the time of works which would be negative and potentially significant at a Site level.
- 8.147 Under current proposals, T5 should be retained but based on current survey results it supports a brown long-eared bat roost (one bat seen emerging in May 2021). The hedgerow which connects to the tree and roost would also be partially lost with an c. 100m section removed for access. Without mitigation and based on the current status of the roost within this tree and species present, it is anticipated that loss of a section of hedgerow could result in a negative impact to a low conservation status bat roost significant up to a Local level. Based on the lack of a complete data set, confidence in this assessment is low.
- 8.148 The majority of the hedgerows will be retained and enhanced through additional planting embedded into the design and new standing water features, anticipated to be beneficial for foraging bats, the Proposed Development could positively and permanently enhance bat foraging and commuting habitat at a Local level over the long-term.
- 8.149 New street lighting and temporary construction lighting may pose a minor negative impact upon bats currently known to be using the Site hedgerow network for foraging and navigation. There is potential for the Proposed Development to have a permanent negative impact if an inappropriate lighting scheme is implemented which, based on survey data gathered to date is considered to be significant at up to a Local level. Confidence level of this assessment is low due to incomplete survey data at present. [This conclusion remains valid following analysis of the updated bat surveys.](#)

Badger

- 8.150 Information pertaining to badgers is provided under confidential **Appendix 8.4** of the original ES.

Hazel Dormouse

- 8.151 ~~Hazel dormice are a European Protected Species and protected under the Conservation of~~

~~Habitats and Species Regulations 2017 (as amended) and the Wildlife and Countryside Act, 1981 (as amended). This species is also listed as a species of principal importance under Section 41 of the NERC Act 2006. In summary, it is an offence to deliberately capture, injure or kill hazel dormice, damage or destroy a dormouse resting place or breeding site, deliberately or recklessly disturb a hazel dormouse while it's in a structure or place of shelter or protection, block access to structures or places of shelter or protection, possess, sell, control or transport live or dead hazel dormice, or parts of hazel dormice.~~

- 8.152 ~~Without mitigation, hazel dormice could be impacted through direct mortality, injury or disturbance during construction, if present at the time of works, which would be negative, permanent and potentially significant at a Local level. Confidence level of this assessment is low due to incomplete survey data at present.~~
- 8.153 ~~During operation, hazel dormice could be affected by disturbance and predation if present. Dormice can persist in urban areas but are prone to being caught by domestic cats (Woods et al. 2003). The effects of this are uncertain and depend on whether the extent of habitat creation and management are sufficient to create a robust hazel dormice population. The Proposed Development includes new supplementary planting around existing hedgerows which could minimise these impacts over time.~~
- 8.154 ~~The limited section of hedgerow to be removed, with the embedded hedgerow enhancement retaining habitat connectivity, means the Proposed Development is considered likely to deliver a net enhancement of dormouse habitat considered to be potentially significant at a Site level with potential for up to Local level effects, if suitable hedgerow species mixes and planting densities are achieved. Confidence level of this assessment is low due to incomplete survey data at present.~~
- 8.155 No records of hazel dormice within 2km of the Site were provided by Essex Wildlife Trust Biological Record (EWTBRC).
- 8.156 The hedgerows on Site were considered in places to provide the required structural diversity to support hazel dormice. No records of this species are known in the area. Presence/absence of hazel dormice surveys have been completed and no hazel dormice were recorded, and currently hazel dormice are not considered to be a potential receptor with respect to the Proposed Development.

Otter and Water Vole

- 8.157 Water vole and their habitat are protected under the Wildlife and Countryside Act 1981 (as amended), which makes it, in summary, an offence to intentionally kill, injure or take (capture) a water vole and intentionally or recklessly damage, destroy or obstruct access to any structure or place which water voles use for shelter or protection or disturb water voles while they are using such a place. This species is also listed as a species of principal importance under Section 41 of the NERC Act 2006.
- 8.158 Otters are a European Protected Species and are protected under the Conservation of Habitats and Species Regulations 2017 (as amended) and the Wildlife and Countryside Act 1981 (as amended). This species is also listed as a species of principal importance under Section 41 of the NERC Act 2006. In summary, it is an offence to capture, kill, disturb or injure otters (on purpose or by not taking enough care), damage or destroy a breeding or resting place (deliberately or by not taking enough care), obstruct access to their resting or sheltering places

(deliberately or by not taking enough care), possess, sell, control or transport live or dead otters, or parts of otters.

- 8.159 The surveys did not identify any presence of otter or water vole along the drainage ditch within the Site, but these areas could be used for foraging and commuting otters/water voles if they become established on a wider network over time and should they be present at the time of construction works. Based on the low suitability of the ditches for supporting these species, the predicted impact without further mitigation is considered to be potentially significant at up to a Site level.
- 8.160 The Proposed Development requires a SuDS scheme including attenuation basins which could be a positive and permanent enhancement for otter and water voles and significant at up to a Site level.

Hedgehog, Brown Hare and Terrestrial Invertebrates

- 8.161 During construction there is a risk of injury to individual hedgehogs during Site preparation and construction due to vegetation clearance, deep excavations and heavy machinery activity. Without mitigation, impacts are considered to potentially be of significance at a Site level for hedgehogs. The Proposed Development will retain the majority of habitats used by hedgehog (hedgerows) and enhance the habitat through creation of native shrub planting, wildflower planting and attenuation areas for drinking which could be positive and permanent enhancement at a Site level.
- 8.162 The Proposed Development will require the loss of an arable field and field margins which could be used by brown hare. No brown hare have been sighted through incidental sightings. Based on the availability of similar habitat in the immediate landscape and the lack of sightings, loss of an arable field is not considered to be of significant to brown hare above a Site level.
- 8.163 The Site is currently considered to provide low general habitat diversity to support a wide range of terrestrial invertebrates due to the dominance of arable habitat management. The Proposed Development has been designed to enhance the botanical diversity of the existing habitats through creation of species rich grassland and creation of four attenuation basins, all of which have the potential to enhance the Site for a variety of terrestrial invertebrates which could be of significance up to a Site level depending on the final planting design.

Mitigation

- 8.164 This section presents mitigation necessary to reduce any significant impacts identified. The mitigation is additional to the embedded mitigation but is considered necessary to prevent significant effects on the ecological features.

Protected Sites

- 8.165 During construction, potential minor negative indirect impacts have been identified due to sediment mobilisation/pollution events. Mitigation should include production of a Pollution Prevention Strategy to be included within the CEMP, prior to works commencing, agreed with the LPA, which can be secured by an appropriately worded planning condition.

Habitats

- 8.166 At the reserved matters stage, the principles set out within the assessment parameter plans and Draft Biodiversity Metric (**Appendix 8.5**) to deliver measurable ecological enhancement, should be implemented through a detailed landscape strategy and LEMP. These principles are:

- Creation of species-rich (seven or more native species) hedgerows of greater length than being lost to accommodate access;
- Creation of species-rich grassland under an appropriate management regime to maintain its value over the long-term, as set out in a detailed landscape strategy and LEMP;
- Planting native trees and shrubs and hedgerow to enhance habitat connectivity and diversity;
- Creation of SuDS features designed to enhance the biodiversity value of the Site; and
- Locations and nature of positive species-specific enhancements e.g. bat/bird boxes, reptile refugia and insect boxes.

8.167 All trees and hedgerows to be retained should have adequate Root Protection Areas (RPAs) in line with BS 5837:2012 Trees in Relation to Design, Demolition and Construction.

8.168 These mitigation measures should be agreed with the LPA and secured via planning condition.

Reptiles

8.169 The risk of killing or injuring reptiles (should they be present at the time of works) will be mitigated through a Reasonable Avoidance Method Statement (RAMS) to be included within the CEMP and to be agreed with the LPA when timing of works are known. With this mitigation in place, there should be no significant effect on reptile populations on the Site, should they be present at the time of works, during construction.

8.170 The LEMP should set out measures to enhance the Site for the benefit of reptiles including appropriate habitat creation and construction of a hibernaculum.

Birds

8.171 The following mitigation measures over the embedded mitigation measures are necessary to ensure the Proposed Development does not have a negative impact upon the wider avian ecological interests of the area, and should be agreed through the LEMP, details of which can be secured through a suitably worded planning condition:

- Include nectar and fruit bearing bushes and trees in any planting areas to enhance foraging habitats for birds controlled through a LEMP;
- Select appropriate native flowers and grassland species mixes which would benefit birds;
- Incorporating appropriate bird boxes into the residential building designs and/or retained trees controlled through a LEMP; and
- Design of SuDS features for the benefit of birds through appropriate native planting and variable water depths.

8.172 During construction, in order to safeguard nesting birds, where possible, vegetation removal and building demolition will be undertaken outside of the bird breeding season (March - August inclusive). Should any clearance works be required outside of this period, the area will be subject to a nesting bird check by a suitably qualified ecologist, no more than 72 hours prior to clearance. Should any nesting behaviour be identified, the area will be fenced off and no clearance will take place until the young have fledged.

Bats

- 8.173 ~~Prior to the reserved matters stage, the bat transect surveys should be completed to confirm the status of the bat roost in T5 and, if required, a European Protected Species Licence should be obtained if loss of the hedgerow is likely to affect the roost.~~
- 8.174 ~~Mitigation should be agreed with Natural England once survey data has been obtained but based on survey data to date, it is anticipated that a suitable bat box could be installed on a mature retained tree on the southern boundary. This should be secured via planning condition before any works affecting hedgerow associated with T5 are undertaken.~~
- 8.175 Bat surveys undertaken between July and August 2021 confirmed the status of the bat roost in T5 as a day roost for a small number brown long-eared bats. Currently T5 will be retained as part of the Proposed Development.
- 8.176 A suitable bat box could be installed on a mature retained tree on the southern boundary as replacement habitat. Should T5 require felling, or hedgerows associated with T5 be affected at the detailed design stage, these works should be undertaken under an appropriate Natural England Licence. This should be secured via planning condition before any works affecting hedgerow associated with T5/associated hedge are undertaken.
- 8.177 Prior to felling any tree and the building on Site, should more than one year have passed since the assessment of bat roosting potential/survey of T5 have been undertaken, they should be re-assessed by an experienced bat ecologist prior to works affecting them commencing. If a bat is found or suspected at any point works affecting that feature should cease immediately and an experienced bat ecologist contacted to determine appropriate mitigation. This should be secured via planning condition and included within the LEMP.
- 8.178 To minimise disturbance during construction, works will finish at least 30 minutes before sunset and commence no earlier than 30 minutes after sunrise during the bat activity period (April to October inclusive). If night working cannot be avoided, works will take place outside of the bat activity period and any lighting should be turned off when works are not in progress and light spill should be directed away from treelines and bat habitats. Details of construction lighting should be agreed with the LPA and secured via planning condition.
- 8.179 Lighting will be necessary in some areas during the operation of the development. For these areas a detailed lighting strategy will be put in place, agreed with the LPA and secured via planning condition, to ensure light spill onto adjacent habitats is avoided and will not diminish the value of the habitats that are retained, created and enhanced. Design of the lighting scheme will follow the principles within the Institution of Lighting Professionals Guidance (ILP, 2018 or latest good practice equivalent). Lighting should use narrow spectrum bulbs avoiding UV and white and blue wavelengths of the light spectrum.
- 8.180 General purpose crevice style bat boxes should be installed on mature trees away from artificial illumination. Bat roosting provision should also be incorporated into new buildings such as bat boxes or access tiles, or creation of a purpose-built bat roost and set out within the LEMP.

Badger

- 8.181 Information pertaining to badgers is provided under confidential **Appendix 8.4** of the original ES.

Hazel Dormouse

- 8.182 ~~The mitigation measures proposed below assume hazel dormouse are present at the time of works and should be reviewed and updated following completion of further surveys.~~
- 8.183 ~~In order to further mitigate construction impacts on hazel dormouse from hedgerow removal, if present, vegetation clearance will be timed in order to encourage hazel dormouse to move into areas of retained (and enhanced) vegetation and under a Natural England European Protected Species Licence (EPSL) unless otherwise agreed with a licensed dormouse ecologist. This should be secured via planning condition and be obtained prior to any works affecting hedgerows/trees commencing.~~
- 8.184 ~~The impacts of habitat loss, fragmentation, disturbance and predation will be mitigated by creation of new habitat in advance of vegetation removal works, and further habitat creation and enhancement as part of the Site detailed landscape design. This will ensure that displaced animals have sufficient habitat to move into and that habitat can support a robust population in the long term. The landscaping on-site will include hedgerow planting and areas of scrubby vegetation connected to the wider landscape. This area of new vegetation will be at least equivalent to total area lost as a result of the Proposed Development and will require areas of new habitat to be managed specifically for hazel dormouse. This should be detailed within the LEMP and, if required, the Natural England EPS Licence.~~
- 8.185 ~~To mitigate the impacts of lighting, any night-time lights will not permanently illuminate long sections of hedgerow or areas of scrub or other corridors used by hazel dormouse and should be secured via a lighting planning condition.~~
- 8.186 The Proposed Development will result in the creation of new habitat potentially suitable for supporting future populations of hazel dormice, should they become resident on site.
- 8.187 If more than one year elapsed prior to commencement of the works, the survey findings should be reviewed, and it may be necessary to repeat surveys in order to ensure up-to-date information and appropriate mitigation.

Otter and Water Vole

- 8.188 No otter or water vole field signs were noted during the surveys; however, the watercourses could be used as commuting and foraging habitat by these species should they become established in the intervening time. A pre-works riparian mammal survey should be carried out prior to works commencing to check for any changes in this species' local distribution along drainage ditches on-site. This should be secured via planning condition.

Hedgehogs, Brown Hare and Terrestrial Invertebrates

- 8.189 During construction, hedgehog will be able to access the Site; however, should a hedgehog be found it should be moved with a gloved hand to a place of suitable shelter and security. At the reserved matters stage, the LEMP should set out how boundary treatments will include hedgehog passes within new fencing to allow continued access to the Site. The CEMP should include measures to minimise impacts to brown hare should they be found during construction. The LEMP should include planting mixes for the benefit of declining terrestrial invertebrates and include installation of bug boxes within the strategic landscape design.

Residual Effects

- 8.190 The following residual effects are anticipated based on data gathered to date, assuming the embedded mitigation and mitigation measures set out are implemented;
- Potential for short-term **minor negative (adverse)** temporary impact to reptiles during construction (if present) at the time of construction, not significant under the EIA Regulations;
 - Potential for a long-term **minor positive (beneficial)** permanent enhancement of reptile habitat on Site (if present) at a Site level and not considered significant under the EIA Regulations;
 - A **negative (adverse)**, permanent impact on farmland birds using arable crop habitats, significant at a Site level and not considered significant under the EIA Regulations. Confidence low;
 - A **positive (beneficial)**, long-term permanent impact on generalist birds through increased provision of nesting and foraging habitat and increasing diversity of habitats through attenuation basins and significant at up to a Local level. Not considered significant under the EIA Regulations;
 - Potential for short-term **minor temporary negative (adverse)** impact to hazel dormice during construction (if present) and not considered to be significant at greater than a Site level. Not considered significant under the EIA Regulations; ~~Confidence low~~;
 - Potential for a long-term **minor positive (beneficial)** permanent enhancement of hazel dormice habitat (if present) at up to a Site level. Not considered significant under the EIA Regulations;
 - A **negative (adverse)** impact on a low status bat roost within T5, significant up to a Site level. Not considered significant under the EIA Regulations; ~~Confidence low~~;
 - A small, **positive (beneficial)**, long-term impact on common bat species through increase provision of roost sites and enhancing foraging/commuting habitat up to a Local level. Not considered significant under the EIA Regulations;
 - A neutral impact on otter and water vole if found during construction. Not considered significant under the EIA Regulations;
 - A small, **positive (beneficial)**, long-term impact on otters and water voles through increase foraging habitat available if they become established and significant at a Site level. Not considered significant under the EIA Regulations;
 - A **positive (beneficial)** permanent impact on hedgehogs at a Site level;
 - Potential for permanent **negative (adverse)** impact to brown hare (if present) at the time of works at a Site level. Not considered significant under the EIA Regulations; and
 - A **positive (beneficial)** permanent impact on terrestrial invertebrate assemblages at a Site level. Not considered significant under the EIA Regulations.
- 8.191 The predicted residual effects are not considered to be significant under the EIA Regulations.

Cumulative Effects

- 8.192 Cumulative impacts have been considered within the assessment of effects taking into consideration the potential cumulative impacts with schemes identified within Chapter 14.

- 8.193 The Proposed Development has been designed to mitigate ecological impacts within the Site boundary and provide ecological enhancement including enhancing the habitat connectivity and quality with the adjacent landscape.

Monitoring

- 8.194 The following monitoring measures are anticipated to be secured via planning condition:
- Each reserved matters application to demonstrate how the detailed layout and landscaping deliver the ecological enhancement and measurable biodiversity enhancement along the principles of this assessment within each reserved matters LEMP. The LEMP should set out monitoring measures to ensure the long term success of landscape planting;
 - Should a EPSL from Natural England be required in respect of hazel dormice and/or bats then works should be undertaken in accordance with all monitoring requirements set out within the EPSL; and
 - The CEMP to include timing of works, appointment of an Ecological Clerk of Works, the Reptile RAMS and any measures to be included from an EPSL.

Summary of Impacts

- 8.195 Overall, the Proposed Development with embedded and additional mitigation will have very few residual effects and none anticipated to be significant under the EIA Regulations. The effects that do remain are discussed for both the construction and operational phases of the Proposed Development.

- 8.196 **Table 8.6A** provides a summary of impacts identified to date.

Table 8.6A: Summary of Identified Impacts

ECOLOGICAL FEATURE	POTENTIAL IMPACT	EMBEDDED AND ADDITIONAL MITIGATION	RESIDUAL IMPACT
Pounce LWS	Sediment Input/Pollution from construction activities. Negative, temporary and significant at Site level.	Stringent Pollution Controls. Production and Implementation of CEMP.	Negligible. Not significant under EIA Regulations.
Arable and arable field margins	Permanent loss of habitat. Significant at Site level.	None.	Permanent loss of habitat. Significant at Site level.
Semi-improved neutral grassland	Loss during construction. Potential for negative permanent impact if appropriate species mix not selected. Significant at Site level.	Each reserved matters application to be accompanied by a LEMP setting out how measurable biodiversity enhancement will be achieved through an appropriate native species mix.	Positive, permanent at a Site level. Not significant under EIA Regulations.

ECOLOGICAL FEATURE	POTENTIAL IMPACT	EMBEDDED AND ADDITIONAL MITIGATION	RESIDUAL IMPACT
Hedgerows	Land take of species-rich hedgerow for access. Embedded mitigation includes provision for net hedgerow enhancement. Potential for negative impact at Site level if appropriate species mix not selected and hedgerows not safeguarded during construction.	Enforcement of adequate RPAs in line with BS 5837:2012 Trees in Relation to Design, Demolition and Construction. Replacement hedgerow planting to ensure native species rich mix as detailed within a LEMP agreed at the reserved matters stage.	Positive permanent at a Site level. Not significant under EIA Regulations.
Watercourses	Net enhancement of standing water habitat through SuDS scheme. Positive, permanent at the Site level. Potential for construction impacts (direct/indirect) through pollution/incursions negative and temporary at a Site level.	Each reserved matters application to be accompanied by a LEMP setting out how the water features within the final SuDS design will use native species mix to enhance this habitat over the long term. Existing watercourse safeguarded during construction through CEMP.	Positive, permanent at a Site level. Not significant under EIA Regulations. Negligible. Not significant under the EIA Regulations.
Reptiles	Potential killing and injuring of individual reptiles during construction if present. Negative permanent at up to a Local level predicted (low confidence). Creation of attenuation ponds, species rich grassland, native shrub, tree planting and wetland grass areas for benefit of reptiles. Positive permanent at the Site level.	The CEMP to include a RAMS Method Statement when construction details are known to minimise impacts during construction to reptiles, should they be present at the time of works. The LEMP to set out measures to enhance the Site for reptiles over the long term including locations of reptile hibernacula, log piles etc.	Negative, temporary at a Site level. Not significant under EIA Regulations. Positive, permanent at a Local level. Not significant under EIA Regulations.

ECOLOGICAL FEATURE	POTENTIAL IMPACT	EMBEDDED AND ADDITIONAL MITIGATION	RESIDUAL IMPACT
Birds	<p>Loss of habitats including arable fields, field margins which could affect bird species dependent on these habitats e.g. skylark. Negative and permanent at the Site level. Low confidence.</p> <p>Risk of killing or injuring nesting birds during demolition/vegetation clearance without mitigation. Negative and permanent at Local level.</p> <p>Creation of new scrub and tree and standing water features for benefit range of urban and farmland bird species. Permanent positive and significant at Local level.</p>	<p>Creation of habitats to benefit wide skylark foraging birds through increasing invertebrate diversity (attenuations ponds/native planting).</p> <p>Vegetation removal/building demolition will be undertaken outside of the bird breeding season (March - August inclusive) or under ecological supervision.</p> <p>LEMP to set out detailed landscape planting for benefit of urban and farmland birds including details of nest boxes.</p>	<p>Negative and permanent to arable dependent species at the-Site level. Not significant under EIA Regulations.</p> <p>Negligible. Not significant under EIA Regulations.</p> <p>Positive permanent significant at a Local level. Not significant under EIA Regulations.</p>
Bats	<p>Demolition of bat roosts if present at the time of building demolition (low likelihood). Negative and permanent at Site level.</p> <p>Removal of hedgerow affecting roost in T5. Negative, permanent and significant at the Local level. Confidence low:</p>	<p>CEMP to include precautionary method statement should a bat be suspected or found during demolition works should cease and a bat ecologist contacted.</p> <p>If T5 is to be affected, a pre-commencement updated Further nocturnal survey of confirmed roosting sites during in the peak maternity period (June and July) to inform mitigation may be required to inform an appropriate licence and should be secured via planning condition. Destruction of roosts under EPSL granted by Natural England or a site registration under the Bat Low Impact Class Licence (LICL) with accompanying bat mitigation plan which will include details of replacement roosting provision and secured via condition if needed.</p>	<p>Negligible. Not significant under EIA Regulations.</p> <p>Positive. Permanent at Site level. Not significant under EIA Regulations. Confidence low.</p>

ECOLOGICAL FEATURE	POTENTIAL IMPACT	EMBEDDED AND ADDITIONAL MITIGATION	RESIDUAL IMPACT
Bats	<p>Creation of attenuation ponds and new planting, strengthening of boundary planting for foraging/ commuting bats. Positive, permanent at Local level.</p> <p>Construction lighting causing disturbance to foraging and commuting bats. New introduced lighting of previously unlit foraging corridors as a result of the Proposed Development. Negative, temporary and permanent up to a Local level.</p>	<p>Biodiversity enhancements including the provision of bat boxes on retained standard trees enhance roosting habitats for roosting bats.</p> <p>Implementation of a LEMP to ensure that bat foraging and commuting habitat is maintained and enhanced.</p> <p>Construction works will be restricted to hours of 07:30 to 17:00 Monday to Friday and 08:00-13:00 on Saturday. Impacts limited to areas subject to overnight security lighting. Detailed lighting design and specification, to be prepared at the detailed design stage should be bat friendly and developed with the input of a bat ecologist.</p>	<p>Positive. Permanent at Local level. Not significant under EIA Regulations.</p> <p>Negligible. Not significant under EIA Regulations. Confidence low.</p>
Badgers	See separate confidential badger report (Appendix 8.4)		
Hazel dormice	Based on data gathered no impacts are predicted	New hedgerows will maintain connectivity and provide suitable habitat over the long term for hazel dormice should they become resident in the area.	Positive and permanent and significant at a Local level if dormice become present. Not Significant under EIA Regulations.

ECOLOGICAL FEATURE	POTENTIAL IMPACT	EMBEDDED AND ADDITIONAL MITIGATION	RESIDUAL IMPACT
Hazel dormice	Risk of killing or injuring hazel dormice if present during vegetation clearance without mitigation. Negative and permanent at Local level.	Complete surveys and, if required, no vegetation clearance until a EPSL has been obtained from Natural England or other appropriate mitigation put in place.	Negligible. Not significant under EIA Regulations. Confidence low.
	Loss of sections of hedgerow and connectivity for hazel dormice (if present) to create access. Negative and permanent at Local level.	Complete surveys. The LEMP (and if needed EPS mitigation strategy) to set out how new hedgerows will maintain connectivity for hazel dormice and hedgerow species selection and planting density for their benefit.	Negligible. Not significant under EIA Regulations. Confidence low.
	Creation of new scrub and hedgerows embedded in layout assumes not for benefit of hazel dormice.	As above.	Positive and permanent and significant at a Local level if dormice are present. Not Significant under EIA Regulations. Confidence low
	Risk of predation from cats introduced from residents of new scheme (if present). Negative and permanent up to a Local level.	As above.	Negligible. Not Significant under EIA Regulations. Confidence low.
Otters and water voles	Risk of injury during construction due to use of heavy machinery in proximity to watercourse. Negative temporary and Site level.	Pre-commencement riparian mammal survey and, if present, appropriate mitigation implemented prior to works commencing. Excavations will be covered overnight or left with a plank of wood or similar to ensure that otters do not become trapped. Furthermore, all chemicals will be stored securely as set out in a CEMP.	Negligible. Not significant under EIA Regulations.
	Enhancement of habitat for otters and water voles through attenuation basins if become present. Positive permanent at Site level.	Each reserved matters application to be accompanied by a LEMP setting out how standing water could benefit these species if applicable at that stage.	Potential positive permanent at Site level. Confidence low. Not significant under EIA Regulations.

ECOLOGICAL FEATURE	POTENTIAL IMPACT	EMBEDDED AND ADDITIONAL MITIGATION	RESIDUAL IMPACT
Hedgehogs, brown hare and terrestrial invertebrates	Risk of injury to hedgehog and brown hare during construction. Negative at the Site level.	CEMP to include measures to safeguard hedgehogs and brown hare during construction.	Negligible. Not significant under EIA Regulations.
	Permanent loss of habitat potentially used by brown hare. Negative and permanent at Site level (if present).	N/A	If present permanent, negative at Site level.
	Enhancement of habitats for hedgehogs and invertebrates and connectivity through landscape planting and creation of attenuation ponds. Positive. Permanent at Site level.	LEMP to set out how barrier treatment to fences maintain habitat connectivity and planting benefit hedgehogs. Selection of planting for benefit of invertebrates and installation of bug boxes.	Positive. Permanent at Site level. Not significant under EIA Regulations.

Flood Risk and Drainage



9.0 Flood Risk and Drainage

- 9.1 No further changes required as part of this Addendum. Chapter 9 of the submitted ES, dated August 2021, remains unchanged and valid.

Landscape

10

10.0 Landscape & Visual

- 10.1 No further changes required as part of this Addendum. Chapter 10 of the submitted ES, dated August 2021, remains unchanged and valid.

Noise and Vibration



11.0 Noise and Vibration

Introduction

- 11.1 This chapter addresses the likely significant noise and vibration impacts of the Proposed Development. It has been prepared by Resound Acoustics Limited to assess the potential impacts of the Proposed Development in relation to the effects it would have on the noise and vibration climate.
- 11.2 This chapter is accompanied by the following appendices:
- Appendix 11.1: Introduction to Noise and Vibration;
 - Appendix 11.2A: Assessment Policy, Standards and Guidelines;
 - Appendix 11.3: Environmental Noise Survey;
 - Appendix 11.4: Construction Noise Assessment; and
 - Appendix 11.5: Operational Noise Assessment.

Potential Impacts

- 11.3 Noise and vibration from construction works affecting off-site sensitive receptors are possible when the works are near those Site boundaries close to sensitive receptors.
- 11.4 The nature of construction is such that short-duration high noise levels are likely at times during the works, with possible adverse effects occurring should heavy ground engineering works be undertaken in close proximity to sensitive receptors.
- 11.5 Vibration from construction works is less likely to be perceptible as it is attenuated in the ground more effectively than noise is in air. However, it is possible that adverse effects could occur where works such as vibratory compaction are undertaken in close proximity to sensitive receptors.
- 11.6 There is potential for development-generated traffic to give rise to adverse noise effects at existing sensitive receptors away from the Site, particularly if the traffic from the Proposed Development combines with traffic from other consented schemes in the area.
- 11.7 Significant adverse effects from road traffic vibration are not considered likely and ~~have, therefore, been scoped-out of the EIA~~; were scoped-out of the original chapter. However, the Scoping Opinion from Uttlesford District Council (UDC) subsequently stated:
- "The Scoping Report seeks to scope in noise for the construction phases and operational noise; and scope in vibration for the construction phase only. It is understood that road traffic vibration is proposed to be scoped out. Given the proximity to Radwinter Road this is not acceptable and road traffic vibration in the operational phase should be scoped in."*
- 11.8 Following receipt of that Scoping Opinion from UDC, consideration has now been given to the potential effects of road traffic vibration associated with the long-term use of the Site.
- 11.9 In the absence of any significant noise or vibration sources in close proximity to the Site, it is considered that the Site is suitable for residential development and no significant adverse effects are likely. Consideration of the suitability of the Site for residential development is, therefore, scoped-out of the EIA.

Methodology

- 11.10 The potential magnitudes of impacts have been determined for the following aspects of the Proposed Development:
- The impact of noise and vibration from construction works have been predicted and assessed in accordance with the guidance set out in British Standard 5228: 2009+A1: 2014 *Code of practice for noise and vibration control on construction and open sites*; and
 - Changes in road traffic noise levels along roads in the vicinity of the Site have been assessed for both the construction and long-term use of the Proposed Development. The traffic noise levels have been calculated in accordance with the Calculation of Road Traffic Noise (CRTN) and the impact of any changes assessed in broad accordance with Design Manual for Roads and Bridges (DMRB) LA 111 Noise and vibration (2020); and
 - Potential effects of road traffic vibration from the operational, long-term occupation of the Site have been considered against the guidance in DMRB LA111, British Standard 7385-2: 1993 Evaluation and measurement for vibration in buildings. Part 2 – Guide to damage levels from groundborne vibration, and other relevant research findings.
- 11.11 Summaries of the various policies, standards and guidance used in the assessment are set out in **Appendix 11.2A**.
- Determination of Magnitude of Impact**
- 11.12 The magnitude of impact from the construction and operation of the Proposed Development have been considered against the potential subjective responses to noise set out in **Table 11.1A**.
- 11.13 The magnitude of impact has been identified as either negligible, low, moderate or high, adverse or beneficial, according to criteria and guidance appropriate for each source.

Table 11.1A: Determination of Impact Magnitude – Potential Subjective Responses

MAGNITUDE OF IMPACT	POTENTIAL SUBJECTIVE RESPONSES
High	The noise/vibration causes a material change in behaviour, attitude or other physiological response, e.g. avoiding certain activities during periods of intrusion; where there is no alternative ventilation, having to keep windows closed most of the time because of the noise. Potential for sleep disturbance resulting in difficulty in getting to sleep, premature awakening and difficulty in getting back to sleep. Quality of life diminished due to change in acoustic character of the area.
Moderate	Noise/vibration can be heard and causes small changes in behaviour, attitude or other physiological response, e.g. turning up volume of television; speaking more loudly; where there is no alternative ventilation, having to close windows for some of the time because of the noise. Potential for some reported sleep disturbance. Affects the acoustic character of the area such that there is a small actual or perceived change in the quality of life.
Low	A minor adverse change from baseline conditions. Noise can be heard, but does not cause any change in behaviour, attitude or other physiological response. Can slightly affect the acoustic character of the area but not such that there is a change in the quality of life.
Negligible	Very little change from baseline conditions. Change barely distinguishable, approximating to a 'no change' situation.

- 11.14 The construction and operational impacts have been assessed using these definitions. The quantified impacts have been considered in terms of effects by taking account of the sensitivity of the affected receptor, and the duration of the impact.

Determination of Magnitude of Impact – Construction Phase

- 11.15 The predicted construction noise levels have been assessed against criteria derived using the 'ABC method' as described in Section E.3.2 of BS5228: 2009+A1: 2014 and summarised in **Appendix 11.2A**.
- 11.16 The descriptions of subjective human responses in **Table 11.1A** have been translated to construction noise magnitudes of impact in the following way, with reference to the criteria set out in Table A10.2.2 in **Appendix 11.2A**:
- Exceeding the adopted criteria by more than 10dB constitutes a high magnitude of impact, irrespective of the duration;
 - Exceeding the adopted criteria by less than 10dB for a period of more than one month constitutes a moderate magnitude of impact;
 - Exceeding the adopted criteria by less than 10dB for a period of less than one month constitutes a low magnitude of impact; and
 - Compliance with the adopted criteria constitutes a negligible magnitude of impact.
- 11.17 The duration of construction vibration is of less significance than it is for noise, since the vast majority of the construction works generating significant levels of vibration will be relatively short in duration. The magnitude of potential construction vibration impacts are categorised according to the vibration magnitude only, as follows:
- Any works causing a vibration level greater than 10mm/s (measured as a peak particle velocity) constitutes a high magnitude of impact;
 - Any works causing a vibration level between 1mm/s and 10mm/s constitutes a moderate magnitude of impact;
 - Any works causing a vibration level between 0.3mm/s and 1mm/s constitutes a low magnitude of impact; and
 - Any works causing a vibration level less than 0.3mm/s constitutes a negligible magnitude of impact.

Determination of Magnitude of Impact – Operational Phase

- 11.18 The magnitude of impact of off-site operational road traffic noise has been determined in accordance with the thresholds set out in Tables A10.2.5 and A10.2.6 in **Appendix 11.2A**, using the calculation methods set out in the CRTN.
- 11.19 The potential effect of road traffic vibration has been considered against the guidance in BS7385-2: 1993, DMRB LA111, and other relevant research on the topic.

Sensitivity of Receptor

- 11.20 The sensitivity of affected receptors to noise and vibration has been determined according to the scale set out in **Table 11.2A**. The receptors themselves have been identified through a review of aerial photography and OS mapping.

Table 11.2A: Determination of Receptor Sensitivity

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

- 11.21 These receptor sensitivity categories apply to receptors for both the construction and operational phases of the Proposed Development.

Assessment of Significance

- 11.22 The magnitude of impact is correlated with the receptor sensitivity to determine the overall significance of the effect, in accordance with **Table 11.3A**. An effect of moderate or major significance is considered significant in an EIA context.

Table 11.3A: Determination of Significance of Effect

MAGNITUDE OF IMPACT	SENSITIVITY OF RECEPTOR			
	HIGH	MEDIUM	LOW	NEGLECTIBLE
High	Major	Moderate	Minor	None
Moderate	Moderate	Minor	Minor	None
Low	Minor	Minor	None	None
Negligible	None	None	None	None

- 11.23 Where significant adverse effects are identified, mitigation measures have been recommended to minimise the adverse effects of the Proposed Development. Any residual effects that may exist after mitigation has been applied are identified.
- 11.24 It is noted that there can be a distinction between any thresholds for identifying significant adverse effects in an ES in accordance with the EIA Regulations, and a significant observed adverse effect on health and quality of life, termed the Significant Observed Adverse Effect Level (SOAEL), which has a particular meaning in planning policy. This distinction has been made clear in recent infrastructure-based planning inquiries, and is enshrined in recently-published guidance on road traffic noise (LA111).
- 11.25 A significant adverse effect in an EIA context does not necessarily equate directly to an exceedance of the SOAEL in planning policy terms, and significant adverse effects should not be taken to mean that a particular policy threshold has been breached.
- 11.26 While the planning policies that give rise to the SOAEL, and the lowest level at which an adverse effect on health and quality of life occurs, or LOAEL, are summarised in **Appendix 11.2A**, there are no numerical definitions in policy for these terms.

Geographical Scope

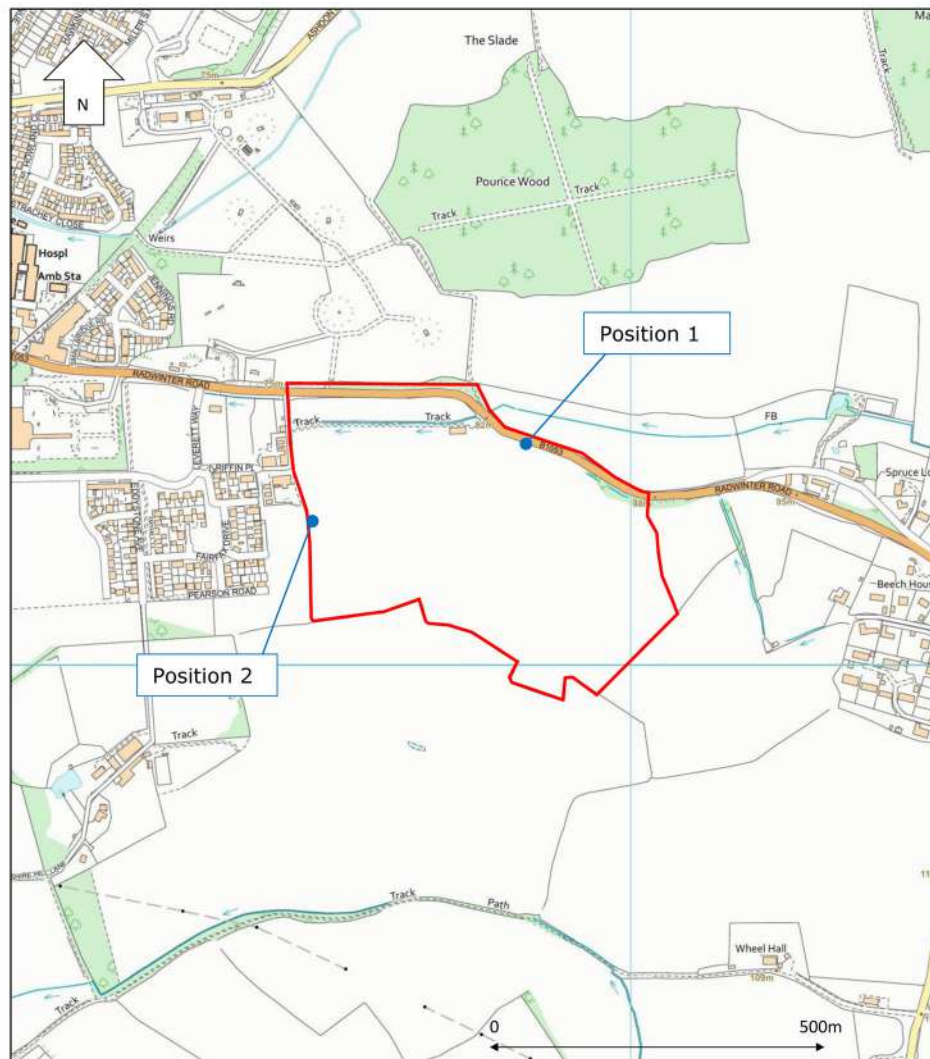
- 11.27 Direct effects from the construction of the Proposed Development on surrounding sensitive receptors have been assessed within an area approximately 500 metres from the Site boundary. However, in practice, the receptors closest to the Site will be the worst-affected, with noise and vibration levels reducing with increasing distance from the Site.
- 11.28 The geographical scope of the assessment of off-site road traffic noise impacts has been determined by the expected traffic dispersion patterns away from the Site and covers roads within approximately 2km of the Site.

Temporal Scope

- 11.29 The assessment has considered both the temporary effects that might result from the construction of the Proposed Development, and the short, medium and long-term effects associated with the use of the Proposed Development once completed.

Existing Baseline Conditions

- 11.30 The noise climate at the Site is influenced by road traffic noise, primarily from Radwinter Road which borders the northern edge of the Site.
- 11.31 A baseline noise survey of sound levels at the Site was undertaken in May 2021.
- 11.32 The measurements were undertaken at two locations, described as follows:
- Position 1: on the northern edge of the Site, close to Radwinter Road; and
 - Position 2: on the western edge of the Site, close to the newly constructed residential area to the west.
- 11.33 The measurement locations are shown in **Figure 11.1A**.



Ordnance Survey © Crown Copyright 2021. All rights reserved. License number 100022432

Figure 11.1A: Noise Monitoring Locations

- 11.34 Details of the equipment used during the baseline survey, the dates and times of the measurements, and a summary of the prevailing weather conditions are set out in **Appendix 11.3 of the original ES**.
- 11.35 The baseline sound survey results are summarised in **Table 11.4A** and **Table 11.5A** for Positions 1 and 2 respectively, and set out in full in **Appendix 11.3 of the original ES**.

Table 11.4A: Summary of Sound Levels Measured at Position 1, Free-Field dB

DATE	PERIOD	DURATION	L _{AEQ,T}	L _{A90} ⁽¹⁾	L _{A10} ⁽¹⁾	L _{AFMAX}
Wednesday 19 th May 2021	Day	10 hours	64.5	39.4	67.0	71.8 to 88.9
	Night	8 hours	54.8	33.1	43.5	38.0 to 80.2

DATE	PERIOD	DURATION	$L_{AEQ,T}$	$L_{A90}^{(1)}$	$L_{A10}^{(1)}$	L_{AFMAX}
Thursday 20 th May 2021	Day	16 hours	65.3	46.5	69.4	75.0 to 91.9
	Night	8 hours	58.6	48.6	61.1	64.5 to 84.5
Friday 21 st May 2021	Day	6 hours	66.0	53.0	70.5	77.8 to 90.6
Note: ⁽¹⁾ – The L_{A90} and L_{A10} values presented were calculated from the arithmetic mean of the $L_{A90,15min}$ and $L_{A10,15min}$ measurements for each period.						

Table 11.5A: Summary of Sound Levels Measured at Position 2, Free-Field dB

DATE	PERIOD	DURATION	$L_{AEQ,T}$	$L_{A90}^{(1)}$	$L_{A10}^{(1)}$	L_{AFMAX}
Wednesday 19 th May 2021	Day	10 hours	41.5	32.7	41.8	42.0 to 67.7
	Night	8 hours	38.3	27.3	34.7	35.0 to 73.1
Thursday 20 th May 2021	Day	16 hours	45.8	39.8	47.0	50.7 to 71.8
	Night	8 hours	48.1	41.8	50.7	55.3 to 67.9
Friday 21 st May 2021	Day	6 hours	49.7	43.8	52.0	57.1 to 69.6
Note: ⁽¹⁾ – The L_{A90} and L_{A10} values presented were calculated from the arithmetic mean of the $L_{A90,15min}$ and $L_{A10,15min}$ measurements for each period.						

- 11.36 It is noted that the weather conditions from the afternoon of Thursday 20th May 2021, until the end of the survey were not suitable for noise measurement, with rain and high wind speeds. Therefore, the noise levels measured during this period have not been included in the assessment, although they are reported in **Tables 11.4A** and **11.5A**.
- 11.37 There is uncertainty in the baseline sound measurements due to the restrictions that were in place at the time of the survey, as part of the Government's response to the COVID-19 pandemic. The restrictions in place as part of this lockdown have the potential to alter road traffic flows and, therefore, road traffic noise levels.
- 11.38 It is likely that the influence of the Government restrictions, should there be any, will reduce road traffic noise levels; for the purposes of determining appropriate criteria for the assessment of construction noise, this will result in a more stringent criterion, which results in a robust assessment.
- 11.39 The assessment of operational off-site road traffic noise is based on traffic data provided by the traffic consultant for the Proposed Development, the evidence base of which has been agreed with the Local Highway Authority. The data provided was prior to the Covid-19 pandemic.

Evolution of the Baseline Conditions without Development

- 11.40 Without the implementation of the Proposed Development, the acoustic climate in the area is likely to remain similar, i.e. dominated by road traffic noise. Road traffic noise levels may change, depending on the number of vehicles using the roads surrounding the Site in the future. However, future baseline noise surveys would be required to confirm this.

Predicted Impacts

Construction

- 11.41 An assessment of the potential impacts of construction noise and vibration has been undertaken.
- 11.42 The construction works are anticipated to involve the following elements:
- Site preparation works, involving chain saws, excavators, dump trucks, loaders and lorries;
 - Foundation works, involving concreting plant, poker vibrators, trucks and lorries;
 - Building erection works, involving lorries, tracked cranes, poker vibrators, manual tasks such as hammering, nail guns and erection of scaffolding, generators and compressors; and
 - Road surfacing and landscaping works, involving lorries, compaction plant, excavators and tarmacing plant.
- 11.43 It is assumed that piling is not required for the Proposed Development.

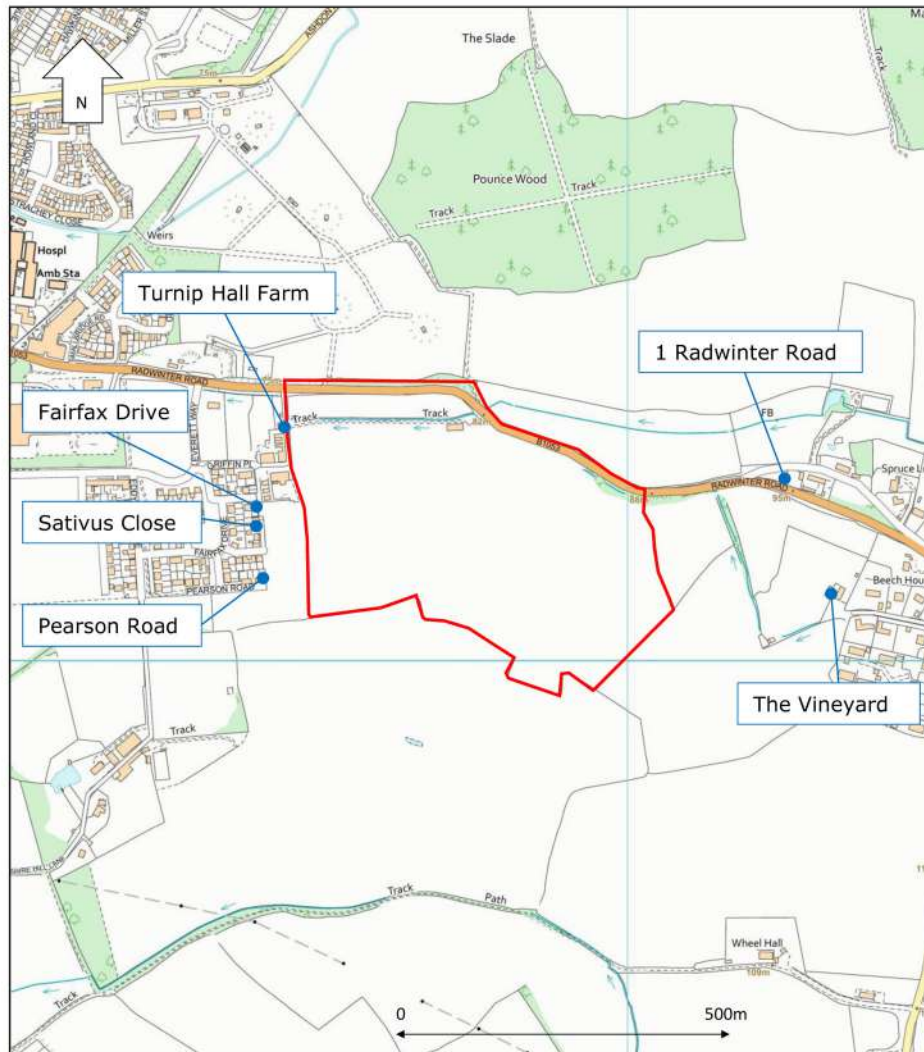
Assessment of Construction Noise

- 11.44 The items of plant assumed for each phase of construction works are set out in **Appendix 11.4 of the original ES**.
- 11.45 The calculations have been undertaken for two situations; an 'average' case where the construction plant are assumed to be at an average distance from receptors, and a 'worst-case' where the construction plant are assumed to be at the part of the Application Site closest to the receptor under consideration. The closest distance between construction works and a receptor for the 'worst-case' assessment is based on a minimum distance of 10 metres; it is highly unlikely that any construction plant items could physically be located closer than this to a receptor.
- 11.46 This gives a range of values representing the average and worst-case noise levels likely to be generated during the works.
- 11.47 Construction noise has been predicted at the receptor locations listed in **Table 11.6A**, and shown in **Figure 11.2A**.

Table 11.6A: Distances Between Receptors and Construction Works (Metres)

RECEPTOR	SITE PREPARATION/ LANDSCAPING		FOUNDATIONS AND BUILDINGS		HARDSTANDING (ROADS AND PATHS)	
	CLOSEST	AVERAGE	CLOSEST	AVERAGE	CLOSEST	AVERAGE
Turnip Hall Farm	10	300	30	280	30	280
Pearson Road	70	340	80	290	80	290
Sativus Close	70	330	80	280	80	280
Fairfax Drive	65	330	80	270	80	270
1 Radwinter Road	210	445	260	480	260	480

RECEPTOR	SITE PREPARATION/ LANDSCAPING		FOUNDATIONS AND BUILDINGS		HARDSTANDING (ROADS AND PATHS)	
	CLOSEST	AVERAGE	CLOSEST	AVERAGE	CLOSEST	AVERAGE
The Vineyard	230	575	340	525	340	525
Note: All distances in metres						



Ordnance Survey © Crown Copyright 2021. All rights reserved. License number 100022432

Figure 11.2A: Construction Assessment Locations

- 11.48 The assessment criteria for each of the receptors have been determined in accordance with Table A10.2.1 in **Appendix 11.2A**, whereby the existing ambient noise levels, rounded to the nearest 5dB, define the assessment criteria.
- 11.49 In this instance, the lowest existing ambient sound levels measured at the Site, rounded to the nearest 5dB, were below 65dB and, therefore, the Category A criterion of 65dB would apply for all receptors.

- 11.50 **Table 11.7A** sets out the predicted unmitigated construction noise levels for each assessment location. Where the construction noise levels are predicted to exceed the adopted 65dB criterion, the values are bolded.

Table 11.7A: Predicted Construction Noise levels, Free-Field dB

RECEPTOR	PHASE OF CONSTRUCTION WORKS(1)				
	1	2	3	4	5
Turnip Hall Farm	60.9 - 90.4	60.8 - 80.2	63.1 - 82.5	55.3 - 74.7	60.5 - 90.0
Pearson Road	59.8 - 73.5	60.5 - 71.6	62.8 - 73.9	55.0 - 66.1	59.4 - 73.1
Sativus Close	60.1 - 73.5	60.8 - 71.6	63.1 - 73.9	55.3 - 66.1	59.6 - 73.1
Fairfax Drive	60.1 - 74.2	61.1 - 71.6	63.4 - 73.9	55.6 - 66.1	59.6 - 73.7
1 Radwinter Road	57.5 - 64.0	56.1 - 61.4	58.4 - 63.7	50.6 - 55.9	57.0 - 63.6
The Vineyard	55.2 - 63.2	55.3 - 59.1	57.6 - 61.4	49.8 - 53.6	54.8 - 62.8
Note: Phases of work as follows: Phase 1 = Site preparation works; Phase 2 = Foundation works; Phase 3 = Building erection works; Phase 4 = Hardstanding/road construction works; and Phase 5 = Landscaping works					

- 11.51 It can be seen from **Table 11.7A** that, when the works are at an average distance from the receptors, which is likely to be the case for the majority of the time, the 65dB criterion is predicted to be met at all receptors for all phases of works; this would be a negligible magnitude of impact.
- 11.52 The 65dB criterion is predicted to be exceeded by more than 10dB at Turnip Hall Farm when all phases of works except Hardstanding/road construction works, are undertaken close to the Site boundary. This would result in a high magnitude of impact.
- 11.53 The 65dB criterion is predicted to be exceeded by less than 10dB at Turnip Hall Farm for Hardstanding/road construction works, and at Pearson Road, Sativus Close and Fairfax Drive for all phases of works, when the works are undertaken close to the Site boundary. If the works were undertaken on the Site boundary for more than one month, this would result in a moderate magnitude of impact. If they were undertaken on the Site boundary for less than one month, this would result in a low magnitude of impact.
- 11.54 The 65dB criterion is predicted to be met at 1 Radwinter Road and The Vineyard, even when works are undertaken close to the Site boundary. This would result in a negligible magnitude of impact.
- 11.55 The above outcomes are predicted to occur when construction works are undertaken at their closest to the receptors, which in practice will only occur for a short period of time. It is also noted that the calculations assume that all plant items for a particular phase of construction works are located at the closest point to a receptor, even though this is not likely to be physically possible in practice.

Assessment of Construction Vibration

- 11.56 Some elements of construction work may generate perceptible levels of vibration at off-site receptors, for example, heavy ground works or vibratory compaction, when they occur close to boundaries of the Site.
- 11.57 Part 2 of BS5228: 2009+A1: 2014 contains a number of formulae that may be used to estimate vibration levels for specific types of activity, such as the use of a vibratory roller or a rotary piling rig. The standard also contains historic vibration data measured at various sites around the UK for a range of piling operations, although piling is not anticipated at the Site.
- 11.58 Transport Research Laboratory (TRL) Report 53 contains historic data for a number of ground engineering works, such as heavy lorries on poor road surfaces, or bulldozers.
- 11.59 The level of vibration from heavy ground works such as bulldozing has been estimated from Figure A10.2.1 in **Appendix 11.2A**, which suggests that vibration levels of more than 1mm/s are unlikely where ground works are undertaken more than approximately 8 to 10 metres from a receptor.
- 11.60 The likely vibration levels from vibratory compaction activities have been calculated using the formulae in Part 2 of BS5228: 2009+A1: 2014. The calculation suggests that vibratory compaction works undertaken at least approximately 50 metres from a sensitive receptor are unlikely to generate vibration levels of 1mm/s or more. However, vibratory compaction works undertaken closer than approximately 10 metres may generate vibration levels of 10mm/s or more.
- 11.61 The closest receptor, Turnip Hall Farm, is approximately 10 metres from the boundary of the Site.
- 11.62 Based on this distance, vibration levels of more than 1mm/s are unlikely due to heavy ground works such as bulldozing. This would result in no worse than a low magnitude of impact.
- 11.63 However, if vibratory compaction is undertaken at or close to the Site boundary, vibration levels are likely to exceed 1mm/s at Turnip Hall Farm, although vibration levels are unlikely to exceed 10mm/s. This would result in a moderate magnitude of impact.
- 11.64 The remaining receptors are all more than 50 metres from the Site boundary and, therefore, vibration levels are unlikely to be higher than 1mm/s, even if vibratory compaction is undertaken at the Site boundary.
- 11.65 As with the construction noise assessment, the above outcomes are all predicted to occur when construction works are undertaken at their closest distance to the receptors, which in practice will only occur for a short duration.
- 11.66 Based on the average distance between works and receptors, which represents the bulk of the construction period, vibration levels are unlikely to exceed 0.3mm/s. This would result in a negligible magnitude of impact.

Assessment of Construction Traffic

- 11.67 Data on likely levels of construction traffic have been confirmed by the traffic consultant for the project. The exact routing of construction traffic is not yet known and will be determined at a later stage. Therefore, as a worst-case, it has been assumed that all construction vehicles could use any road surrounding the Site, even though this cannot occur in practice.

- 11.68 The traffic flows including the peak construction traffic are shown in Table A10.4.6 in **Appendix 11.4 of the original ES**. The existing 2019 baseline flows along each road have also been provided.
- 11.69 Traffic noise predictions have been carried out at a notional receptor location 10 metres from the edge of each carriageway and 1.5 metres above ground level. A notional receptor has been used because it is the change in traffic noise level that is of interest, not the absolute noise levels at any given receptor. The predicted changes in noise level will occur at noise-sensitive receptors along the road considered.
- 11.70 The likely changes in road traffic noise levels, as a result of the construction traffic, are shown in Table A10.4.7 in **Appendix 11.4 of the original ES**.
- 11.71 It can be seen from Table A10.4.7 in **Appendix 11.4 of the original ES** that changes in road traffic noise levels are predicted to be less than 1dB. This would result in a negligible magnitude of impact.

Operation

Off-site Road Traffic Noise

- 11.72 Road traffic data for roads around the Site has been supplied by the traffic consultant for the project. The data has been supplied with and without traffic generated by the Proposed Development so that its effect on existing road traffic noise levels can be determined.
- 11.73 Traffic noise predictions have been carried out at notional receptor locations 10 metres from the edge of each carriageway and 1.5 metres above ground level. Notional receptors have been used because it is the changes in traffic noise levels that are of interest, not the absolute noise levels at any given receptor. The predicted change in noise level will occur at noise-sensitive receptors along each road considered.
- 11.74 The supplied daytime traffic flows are set out in **Appendix 11.5 of the original ES**, in Table A10.5.1 for the baseline year of 2019 and for the year of opening (2026) with and without the Proposed Development, and in Table A10.5.2 for the baseline year of 2019 and the year 2041, which is the year anticipated to have the highest traffic flows within 15 years of the opening year, with and without the Proposed Development.
- 11.75 The assessment of off-site road traffic noise has been repeated for the night-time period. The supplied night-time traffic flows are set out in Table A10.5.3 for the year of opening (2026) and in Table A10.5.4 for the year 2041, in **Appendix 11.5 of the original ES**.
- 11.76 It should be noted that the noise assessment has adopted a worst case opening year of 2026 to provide a robust assessment.
- 11.77 For the night-time period, the changes in road traffic noise have been calculated on the same basis as the daytime calculations, but using the one hour calculation method instead of the 18 hour calculation method. The eight hour night-time traffic flows are assumed to be spread evenly across eight, one hour periods, and the calculated one hour values are aggregated to determine the eight hour value.
- 11.78 The vehicle speeds have been modelled in accordance with the guidance in CRTN, according to the class of road. As required in CRTN, low flow corrections have been applied to all routes with a daytime flow of less than 4,000 vehicles, or night-time flow of less than 200 vehicles per hour.

- 11.79 The predicted changes in daytime road traffic noise levels as a result of the use of the Proposed Development are shown in Table A10.5.5 for the year of opening (2026) and Table A10.5.6 for the year 2041, in **Appendix 11.5 of the original ES**.
- 11.80 It can be seen from Table 10.5.5 in **Appendix 11.5 of the original ES** that for the year of opening (2026), the changes on all of the links are predicted to be less than 1dB; this would result in a negligible magnitude of impact in the short-term.
- 11.81 It can be seen from Table 10.5.6 of **Appendix 11.5 of the original ES** that for the year anticipated to have the highest traffic flows within 15 years of the opening year (2041), the changes on all of the links are predicted to be less than 3dB; this would result in a negligible magnitude of impact in the long-term.
- 11.82 The predicted changes in night-time road traffic noise levels as a result of the use of the Proposed Development are shown in Table A10.5.7 for the year of opening (2026) and Table A10.5.8 for the year 2041, in **Appendix 11.5 of the original ES**.
- 11.83 It can be seen from Table 10.5.7 in **Appendix 11.5 of the original ES** that for the year of opening (2026), the changes are predicted to be less than 1dB; this would result in a negligible magnitude of impact in the short-term. There is a decrease of 1.9dB predicted on one link, Newport; this would result in a low magnitude benefit in the short-term.

Off-site Road Traffic Vibration

- 11.84 UDC has requested that the potential effect of off-site road traffic vibration be assessed for the long-term operational occupation of the Site.
- 11.85 As set out in **Appendix 11.2A**, there are two key components to vibration from road traffic:
- groundborne vibration, which is caused by the interaction between the road surface and the vehicle and is transmitted through the ground into the receptor building; and
 - low frequency airborne sound, which is typically caused by heavy goods vehicle engines and exhausts, and propagates through the air before inducing vibration in the receptor building.
- 11.86 The low frequency sound from heavy goods vehicle engines and exhausts is typically 'felt' or 'observed' through its effect on objects such as ornaments rattling on a shelf, rather than heard. Such non-auditory cues can increase concerns about damage to buildings from occupants, but low frequency airborne sound will generally only affect human perception rather than physical structures.
- 11.87 The traffic data provided for the Proposed Development, as summarised in **Appendix 11.5** of the original ES, shows that the development is not expected to generate any heavy goods traffic as a matter of routine once completed. On this basis, it is reasonable to conclude that there will be a negligible magnitude of impact as a result of low frequency sound from heavy goods vehicle engines and exhausts.
- 11.88 Significant levels of groundborne vibration are generally only caused by road traffic when there are defects or discontinuities in the surface of the road; road traffic vibration is scoped-out of the current version of DMRB entirely on the basis that significant effects will not occur on a well-maintained road.

- 11.89 Where defects or discontinuities are present, any consequential effects will not be limited to traffic from the Proposed Development but from existing traffic too; since the Proposed Development, once completed, will not routinely generate any heavy goods traffic, significant vibration is more likely to be caused in those circumstances by existing traffic than traffic from the Proposed Development.
- 11.90 Since the maintenance of the local road network is the responsibility of the relevant Highways Authority, the expectation is that the roads will be kept in good working order and any defects or discontinuities repaired in a timely manner.
- 11.91 On this basis, it is expected that there will be a negligible magnitude of impact as a result of operational road traffic vibration from the Proposed Development.

Evaluation of Predicted Impacts

Construction

Assessment of Construction Noise

- 11.92 The assessment of construction noise showed that a high magnitude of impact was predicted for one receptor, Turnip Hall Farm, when works are undertaken close to the Site boundary with that receptor. When combined with the high sensitivity of receptor, this would result in a **major adverse** effect, which is considered to be significant in an EIA context.
- 11.93 For Pearson Road, Sativus Close and Fairfax Drive, a moderate magnitude of impact was predicted if works were undertaken on the closest Site boundary for more than one month, and a low magnitude of impact was predicted if works were undertaken on the closest Site boundary for less than one month. In practice, it is considered unlikely that works would be undertaken on the closest Site boundary to a receptor for more than one month and, therefore, there would be a low magnitude of impact. When combined with the high sensitivity of receptor, this would result in a **minor adverse** effect, which is not significant in an EIA context.
- 11.94 For 1 Radwinter Road and The Vineyard, a negligible magnitude of impact was predicted. When combined with the high sensitivity of receptor, this would result in a **negligible** effect, which is not significant in an EIA context.
- 11.95 The above outcomes are all predicted to occur when construction works are undertaken at their closest distance to the receptors, which in practice will only occur for a short duration.
- 11.96 Based on the average distance between works and receptors, which represents the bulk of the construction period, noise levels are likely to result in a negligible magnitude of impact. When combined with the high sensitivity of receptor, this would result in a **negligible** effect, which is not significant in an EIA context.
- 11.97 All construction noise effects would be temporary.

Assessment of Construction Vibration

- 11.98 The assessment of construction vibration showed that no worse than a low magnitude of impact is predicted for the majority of works, even if they are undertaken close to the Site boundaries. When combined with the high sensitivity of receptor, this would result in a **minor adverse** effect, which is not significant in an EIA context.

- 11.99 However, if vibratory compaction is undertaken at or close to the Site boundary with one receptor, Turnip Hall Farm, a moderate magnitude of impact is possible. When combined with the high sensitivity of receptor, this would result in a **moderate adverse** effect, which is significant in an EIA context.
- 11.100 The above outcomes are all predicted to occur when construction works are undertaken at their closest distance to the receptors, which in practice will only occur for a short duration.
- 11.101 Based on the average distance between works and receptors, which represents the bulk of the construction period, vibration levels are likely to result in a negligible magnitude of impact. When combined with the high sensitivity of receptor, this would result in a **negligible** effect, which is not significant in an EIA context.
- 11.102 All construction vibration effects would be temporary.

Assessment of Construction Traffic

- 11.103 The assessment of construction traffic noise showed that any increases in noise, as a result of the construction of the Proposed Development, would result in a negligible magnitude of impact.
- 11.104 When combined with the high sensitivity of receptors around the Site, this would result in a **negligible** effect, which is not significant in an EIA context.

Operation

Off-site Road Traffic Noise

- 11.105 The assessment of off-site road traffic noise showed that any increases in noise, as a result of the Proposed Development, would result in negligible magnitudes of impact in both the short-term and long-term. A decrease in noise that would be a low magnitude benefit was predicted on one road link in the short-term.
- 11.106 When combined with the high sensitivity of receptors around the Site, the negligible magnitudes of impact would result in a negligible effect. The low magnitude of impact would result in a **minor adverse** effect. These effects are not significant in an EIA context.

Off-Site Road Traffic Vibration

- 11.107 The consideration of off-site road traffic vibration suggests that there will be a negligible magnitude of impact as a result of road traffic from the operational development. Even allowing for high sensitivity receptors that are situated along roads close to the Site, a negligible effect is expected, which is not significant in an EIA context.

Mitigation

Construction Phase

- 11.108 The assessment of potential noise and vibration from the construction phase of the Proposed Development identified the potential for significant adverse effects when construction works are undertaken at their closest to receptors. However, these are only likely to occur for a short duration. For the majority of the time, when works are undertaken at an average distance from receptors, no significant effects are likely.
- 11.109 Notwithstanding this, measures to control construction activities to further minimise the potential construction noise and vibration effects could include:

- Phasing the development of the Application Site to minimise the period where noisy works are undertaken close to the Application Site boundaries;
- Adhering to agreed working hours;
- Controlling off-site parking of construction traffic on the public highway;
- Implementing a traffic management system at site entrances at all times to control the traffic into the Application Site and the discharge of trucks from the Application Site to avoid congestion;
- Minimising disturbance from reversing alarms through measures such as site layout, provision of screening, or use of broadband sound emitting reversing alarms;
- Using 'silenced' plant and equipment wherever possible;
- Switching off vehicle engines where vehicles are standing for a significant period of time;
- Operating plant at low speeds where possible and incorporating automatic low speed idling;
- Selecting electrically driven equipment where possible in preference to internal combustion powered, hydraulic power in preference to pneumatic, and wheeled in lieu of tracked plant;
- Maintaining all plant properly (greased, blown silencers replaced, saws kept sharpened, teeth set and blades flat, worn bearings replaced, etc);
- Giving consideration to temporary screening or enclosures for static noisy plant to reduce noise emissions, and certifying plant to meet any relevant EC Directive standards; and
- Making all contractors familiar with the guidance in BS5228 (Parts 1 and 2) which should form a pre-requisite of their appointment.

11.110 Implementing the above measures will reduce noise and vibration from the construction works. The exact magnitude of the reductions will depend on the detail of the proposed construction techniques, however, reductions in construction noise of between 5 and 10dB can be expected.

11.111 The exact reduction in terms of construction vibration is harder to quantify, as it is site-specific, and can only be determined when a contractor is appointed.

11.112 The above measures could be implemented as part of a CEMP, which could be secured through planning condition.

Operational Phase

11.113 The assessment of off-site road traffic noise and vibration suggests that there would be no significant adverse effects and ~~no~~ no mitigation measures are considered necessary, beyond the local highway authority maintaining the roads in a good, serviceable condition.

Residual Effects

Construction Phase

11.114 With an assumed 5dB reduction in construction noise levels provided by appropriate mitigation, which is considered feasible, and outlined above, the construction noise levels would be reduced to below the 65dB criterion at Pearson Road, Sativus Close and Fairfax Drive for 'Hardstanding/road construction works' when they are undertaken at their closest to the receptors. The magnitude of impact would, therefore, reduce from low/moderate to negligible, which, with the high sensitivity of receptors, would result in a **negligible** effect, which would not be significant in an EIA context.

- 11.115 Even with mitigation, construction noise levels are still likely to exceed the 65dB criterion by more than 10dB at Turnip Hall Farm for all phases except the 'Hardstanding/road construction works', when works are undertaken at their closest. This would result in a **major adverse** effect, which would be significant in an EIA context.
- 11.116 Construction noise levels are predicted to exceed the 65dB criterion by less than 10dB at Turnip Hall Farm for 'Hardstanding/road construction works', and at Pearson Road, Sativus Close and Fairfax Drive for all phases except 'Hardstanding/road construction works', when works are undertaken at their closest. On the assumption that it is unlikely that the works would be undertaken on the closest Site boundary for more than one month, this would result in a **minor adverse** effect, which is not significant in an EIA context.
- 11.117 These outcomes occur when construction works are undertaken at their closest to receptors, which, in practice, will only occur for a short duration.
- 11.118 The 65dB criterion is not predicted to be exceeded for the majority of the works, where they are away from the Site boundaries, which would result in a negligible magnitude of impact. Even when considering the high sensitivity of receptors, this would result in a **negligible** effect, which is not significant in an EIA context.
- 11.119 The distances from receptors at which construction noise levels would meet the 65dB criterion, resulting in a negligible effect, are 110 metres for 'Site preparation works', 100 metres for 'Foundations and Landscaping works', 130 metres for 'Building erection works', and 55 metres for 'Hardstanding/road construction works'.
- 11.120 Even taking into account measures to reduce vibration from construction works, vibration levels may exceed 1mm/s at Turnip Hall Farm, if vibratory compaction is undertaken at or close to the Site boundary with this receptor, although vibration levels are unlikely to exceed 10mm/s.
- 11.121 This would result in a moderate magnitude of impact, which would result in a **moderate adverse** effect when combined with the high sensitivity of receptor, which is significant in an EIA context.
- 11.122 However, as with the construction noise assessment, this outcome is only predicted to occur when construction works are undertaken at their closest distance to the receptor, which in practice will only occur for a short duration.
- 11.123 Where the works are away from the Site boundaries, vibration levels are unlikely to exceed 0.3mm/s, which would result in a negligible magnitude of impact. Even when considering the high sensitivity of receptors, this would result in a **negligible** effect, which is not significant in an EIA context.
- 11.124 The assessment of construction traffic noise suggests that there would be no significant adverse effects, even without taking into account any mitigation.

Operational Phase

- 11.125 The assessment of off-site road traffic noise and vibration suggests that there would be no significant adverse effects, even without taking into account any mitigation.

Cumulative Effects

Intra-Project Effects

- 11.126 This section assesses the likely significant environmental effects of potential noise and vibration emissions from the Proposed Development on nearby noise-sensitive receptors from both its construction and operational use.
- 11.127 When construction works are undertaken at an average distance from off-site receptors, which should be the case for the majority of the time, no significant adverse effects are predicted. The distances from receptors at which construction noise levels would result in no residual significant adverse effects are 110 metres for 'Site preparation works', 100 metres for 'Foundations and Landscaping works', 130 metres for 'Building erection works', and 55 metres for 'Hardstanding/road construction works'.
- 11.128 No significant adverse effects are predicted on off-site road traffic noise levels as a result of the operation of the Proposed Development.
- 11.129 There is the potential for an interaction or combination of noise, dust and air quality on the same receptors during construction and operational phases.
- 11.130 Chapter 7 assesses the likely significant air quality effects of the Proposed Development on relevant receptors, including nearby residential receptors during construction and operation.
- 11.131 The assessment concludes that impacts can be sufficiently controlled provided appropriate mitigation measures are implemented during construction, residual effects will be negligible and not significant in an EIA context. Therefore, any combined effects of noise and dust on nearby receptors during the construction phase is not predicted to be any greater than already identified through this chapter.
- 11.132 The assessment also concludes that with the incorporation of mitigation measures within the design of the Proposed Development, residual effects will be negligible and not significant in an EIA context. Therefore, any combined effects of noise and air quality during the operational phase is not predicted to be any greater than already identified through this chapter.

Inter-Project Effects

- 11.133 Other schemes, both permitted and potential, have been considered to determine whether there is likely to be any cumulative effect with the Proposed Development.
- 11.134 The specific schemes have been identified in Chapter 14 of the [original ES](#), and [this Addendum](#). The schemes identified are residential, or predominantly residential developments. Therefore, the key cumulative effects are likely to be related to off-site road traffic noise levels, and it is understood that traffic from the schemes has already been included in the supplied traffic data.

Monitoring

- 11.135 The exact details of any construction noise or vibration monitoring measures would be set out in a CEMP, which would be secured by planning condition.

Summary of Impacts

- 11.136 This chapter sets out the potential impacts, mitigation and residual impacts associated with noise from the Proposed Development. These impacts have been assessed in terms of their effect, and the significance of these effects assessed in EIA terms.
- 11.137 The noise climate at the Site is influenced by road traffic noise, primarily from Radwinter Road, which borders the Site to the north and the existing noise levels at the Site have been established by direct measurement.
- 11.138 The construction phase of the Proposed Development has been considered to determine whether construction noise and vibration is likely to lead to significant effects at the noise and vibration sensitive receptors close to the Site. The following conclusions have been reached:
- Construction noise may lead to significant adverse effects at Turnip Hall Farm without mitigation measures when works are undertaken on the boundaries of the Site closest to the receptors. However, these significant effects would only occur for a short duration and for the majority of the time, no significant effects would occur;
 - Construction vibration may lead to significant adverse effects at sensitive receptors without mitigation measures when works are undertaken on the boundaries of the Site closest to the receptors. However, these significant effects would only occur for a short duration and for the majority of the time, no significant effects would occur; and
 - The effect of construction traffic on off-site road traffic noise levels will not be significant.
- 11.139 The operational phase of the Proposed Development has been considered to determine whether operational road traffic noise ~~and vibration are~~ **is** likely to lead to significant effects at ~~the noise-~~ sensitive receptors close to the Site. No significant effects are likely.
- 11.140 A range of best practice mitigation measures has been suggested to reduce noise and vibration levels from construction, tried and tested measures whereby their effectiveness can be relied upon and controlled through suitably worded planning conditions. However, even with these measures in place, significant adverse effects could still occur at noise-sensitive receptors when works are undertaken on the boundaries of the Site closest to the receptors. However, these significant effects would only occur for a short duration and for the majority of the time, no significant effects would occur, even without taking into account mitigation. Given the nature of the effect, there would be no long term residual effects.
- 11.141 The likely impacts and effects are summarised in **Table 11.8A**.

Table 11.8A: Summary of Impacts: Noise and Vibration

DESCRIPTION OF IMPACT		GEOGRAPHICAL IMPORTANCE		RECEPTOR SENSITIVITY		MAGNITUDE		IMPACT BEFORE MITIGATION				MITIGATION		IMPACT AFTER MITIGATION (RESIDUAL)									
								ADVERSE/BENEFICIAL		REVERSIBLE/IRREVERSIBLE		SHORT-TERM/LONG TERM		SIGNIFICANCE		ADVERSE/BENEFICIAL		REVERSIBLE/IRREVERSIBLE		SHORT-TERM/LONG TERM		SIGNIFICANCE	
Construction Noise – when works undertaken at their closest to following receptors:																							
Turnip Hall Farm		Loc	High	High	High	Adv	Rev	ST	Maj	Appropriate measures implemented during construction phase; these could be incorporated into a CEMP				Adv	Rev	ST	Maj						
Pearson Road, Sativus Close, Fairfax Drive		Loc	High	High	Low	Adv	Rev	ST	Min					Adv	Rev	ST	Min						
1 Radwinter Road, The Vineyard		Loc	High	High	Neg	Adv	Rev	ST	Neg					Adv	Rev	ST	Neg						
Construction Noise – when works undertaken at average distance from receptors		Loc	High	High	Neg	Adv	Rev	ST	Neg					Adv	Rev	ST	Neg						
Construction Vibration – when works undertaken at their closest to following receptors:																							
Turnip Hall Farm		Loc	High	High	Mod	Adv	Rev	ST	Mod	Appropriate measures implemented during construction phase; these could be incorporated into a CEMP				Adv	Rev	ST	Mod						
Pearson Road, Sativus Close, Fairfax Drive, 1 Radwinter Road, The Vineyard		Loc	High	High	Low	Adv	Rev	ST	Min					Adv	Rev	ST	Min						
Construction Vibration – when works undertaken at average distance from receptors		Loc	High	High	Neg	Adv	Rev	ST	Neg					Adv	Rev	ST	Neg						
Construction Traffic		Loc	High	High	Neg	Adv	Rev	ST	Neg	Appropriate measures implemented during construction phase; these could be incorporated into a CEMP				Adv	Rev	ST	Neg						

DESCRIPTION OF IMPACT	GEOGRAPHICAL IMPORTANCE	RECEPTOR SENSITIVITY	MAGNITUDE	IMPACT BEFORE MITIGATION				MITIGATION				IMPACT AFTER MITIGATION (RESIDUAL)			
				ADVERSE/BENEFICIAL	REVERSIBLE/IRREVERSIBLE	SHORT-TERM/LONG TERM	SIGNIFICANCE					ADVERSE/BENEFICIAL	REVERSIBLE/IRREVERSIBLE	SHORT-TERM/LONG TERM	SIGNIFICANCE
Operational Traffic Noise– all links except Newport (Link ID K1) in short-term, all links in long-term	Loc	High	Neg	Adv	Irrev	ST/LT	Neg	-				Adv	Irrev	LT	Neg
Operational Traffic Noise Newport (Link ID K1) in short-term	Loc	High	Low	Ben	Irrev	ST	Min					Ben	Irrev	ST	Min
Operational Traffic Vibration - all roads	Loc	High	Neg	Adv	Irrev	ST/LT	Neg	none required				Adv	Irrev	LT	Neg

Key:

Loc: Local

Adv: Adverse

Min: Minor

Rev: Reversible

LT: Long Term

Mod: Moderate

Neg: Negligible

Maj: Major

Ben: Beneficial

Irrev: Irreversible

ST: Short Term

Socio-Economics and Health

12

12.0 Socio-Economics and Health

Introduction

- 12.1 This chapter addresses the socio-economic and health impacts of the Proposed Development. It has been prepared by RSK to assess the impacts of the Proposed Development in relation to the effects it would have on the socio-economic and health environment.
- 12.2 The chapter is supported by the London Health Urban Development Unit (HUDU) Rapid Health Impact Assessment (HIA) checklist, provided in **Appendix 12.1** of the original ES.

Potential Impacts

Socio-Economics

- 12.3 The construction of the Proposed Development would provide for employment opportunities for local construction contractors and labourers. Although not all workers are likely to be sourced from within a commutable distance, it is likely that only a small portion would be resident in the local community during the construction phase. Due to the short-term nature of the construction phase, this is unlikely to result in significant demand on local services during construction.
- 12.4 The Proposed Development would provide for up to 233 residential units once completed. This would have beneficial effects on the housing provision within the local area. An increase in population may also result in increase in the working age population. However, a potential increase in the population would also result in additional demand and pressure on public services, in particular on education and healthcare.

Health and Quality of Life

- 12.5 The construction of the Proposed Development may result in a temporary increased noise, dust, plant and vehicle emissions. Air pollution is a major environmental risk to health and an increased level of dust particles during construction can result in nuisance, resulting in reduced quality of life. Construction noise can also result in nuisance, also effecting wellbeing and the quality of life. Increased traffic due to construction vehicles can have an effect on pedestrian amenity and cause fear and intimidation, as well as lead to a reduction of safety and increased car accidents. These impacts would, however, be short-term and temporary due to the short-term nature of the construction phase.
- 12.6 Once the Site is operational and occupied the main impacts are likely to be from increased traffic. Increased traffic can effect pedestrian amenity and safety as well as lead to increased air pollution and noise, with consequent effects on health and quality of life. There would, however, be some positive health impacts resulting from the creation of more formalised open space throughout the development and links to sustainable movement e.g. maintained and adequately lit footpaths encouraging movement and activity.

Methodology

- 12.7 Unlike other topics assessed with an EIA, there is no legislation that specifies the content for a socio-economic assessment or health impact assessment, or appropriate standards and thresholds for use in significance criteria. These assessments have, therefore, been informed by professional experience and knowledge. The principles of the assessment have been based on 'International Principles for Social Impact Assessment' (International Association for Impact

Assessment (IAIA), 2003), the Additionality Guide (Homes & Communities Agency (HCA), 4th Edition, 2014). With regards to health assessment; best practice health impact guidance from the HUDU has been considered along with regard to the UDC Health and Wellbeing Impact Checklist which covers similar themes and topics relating to health. Consultation with Dave Toombs, Senior Health Improvement Officer at UDC took place on Friday 12th March 2021 to confirm the proposed approach to the health assessment. This was verbally agreed with a written follow up sent to Dave Toombs by email from RSK. Cross reference is also made to other technical assessments reported within this ES where potential impacts on human health have been considered.

- 12.8 A desk-based assessment has been completed for the scope defined above, using information in the public domain, together with further information and issues raised through consultation.

Study Area

- 12.9 The Site is located within Ashdon Ward but is in close proximity to Saffron Walden Castle Ward and Saffron Walden Shire Ward. For the purposes of the assessment, a Local Impact Area (LIA) has been set at a 5km radius around the Site to allow consideration of impacts on nearby communities. The Wider Impact Area (WIA) has been defined as Uttlesford District, Essex County and the East of England, as appropriate (these categories have been made with respect to the availability of information for these areas).

Assessment Years (Temporal Scope)

- 12.10 Baseline data for the Socio-Economic Assessment was collated in 2021 and, as such, the baseline year for the assessment is taken as 2021. However, it should be noted that due to publication programmes, much of the baseline data relates to earlier years.
- 12.11 Baseline data for health impacts was also collated in 2021, therefore, the baseline year for the assessment is taken as 2021. At the time of writing, the Coronavirus Pandemic continues to be a large factor in Public Health within England. Whilst this situation is severe, it is not expected that the impacts from Coronavirus will alter the baseline information presented within this chapter. Therefore, no further consideration has been given to Coronavirus in this chapter.
- 12.12 Subject to planning, construction is currently proposed to start in 2023, with the first properties available later in 2024. The Proposed Development is anticipated to be completed approximately seven years following commencement. Should either of these dates change significantly the assessment would require review and validation or update.

Existing Baseline Conditions

- 12.13 Existing baseline information has been collected from a desk-based review of publicly available information, including:
- Office for National Statistics (ONS) – regional profiles, population estimates and census data;
 - Public Health England (PHE) – health indicators;
 - National Health Service (NHS) – NHS services and statistics;
 - UDC Local Plan documents – Needs Assessment;
 - Department for Education - school capacity figures; and,
 - ECC – school capacity forecasts, area profiles.

Predicted Impacts

- 12.14 An assessment has been made of the significance of likely socio-economic effects for construction and operation of the Proposed Development, considering the importance and sensitivity of receptors, the size (magnitude) of impact, how long the impact occurs and how likely it is to occur, based on the information available at the time of assessment. Significance criteria are outlined below, together with further detail on the calculations undertaken as part of the assessment.
- 12.15 Employment created during the construction phase of the Proposed Development has been calculated by dividing the estimated value of the project by the Gross Value Add (GVA) per construction industry employee. This figure is referred to as 'job years'. Following economic conventions adopted by HM Treasury, ten job years of employment can be taken as equivalent to one full time job (known as full time equivalent or FTE). This employment would be temporary as its duration is dependent on the length of the construction period.
- 12.16 Indirect (local suppliers) and induced (local services) employment opportunities would also be generated by the Proposed Development. Indirect levels of operational employment have been assessed using the relevant employment multipliers. Whilst it is accepted that the impacts of the development will be felt at least at a regional level no account has been taken for leakage as no beneficiary group is identified. Both displacement and substitution effects are considered qualitatively.
- 12.17 The London HUDU Rapid HIA tool has been completed in order to assess the potential health impacts as a result of the Proposed Development. The completed checklist can be found in **Appendix 12.1 of the original ES** and covers a similar scope to that outlined in the Promoting Healthier and Active Communities – Pre-Application Checklist found on the Uttlesford.Gov.uk website.
- 12.18 The Rapid HIA tool is designed to assess the likely health impacts of development plans and proposals and helps identify those determinants of health which are likely to be influenced by a specific development proposal. The tool provides an assessment matrix based on eleven topics or broad determinants as follows:
- Housing design and affordability;
 - Access to health and social care services and other social infrastructure;
 - Access to open space and nature;
 - Air quality, noise and neighbourhood amenity;
 - Accessibility and active travel;
 - Crime reduction and community safety;
 - Access to healthy food;
 - Access to work and training;
 - Social cohesion and inclusive design;
 - Minimising the use of resources; and
 - Climate change.
- 12.19 Potential impacts on human health have also been addressed within specific topic chapters throughout the **original ES** i.e. Transport (Chapter 13), Air Quality (Chapter 7) and Noise and

Vibration (Chapter 11). This chapter will cross refer to health impacts identified within these chapters.

Significance Criteria

- 12.20 There is no formalised technical guidance or criteria available in regard to the assessment of socio-economic effects. As such, the assessment will be qualitative in nature and the criteria used to determine the significance of effects will be formulated with professional judgement and experience of similar developments.
- 12.21 The criteria in **Table 12.1A** is proposed to assess the sensitivity and importance of the receptor, while the criteria in **Table 12.2A** will be used to define the magnitude of impact. The significance of effect will be assessed based on the receptor sensitivity and the impact magnitude.

Table 12.1A: Receptor Sensitivity / Importance

RECEPTOR SENSITIVITY / IMPORTANCE	VALUE	DESCRIPTION
International / National	Very high	Receptor of international importance and scale with very limited potential for substitution e.g. the international economy.
National	High	Receptor of national importance and scale with limited potential for substitution or reparation e.g. the national economy, national cycle routes, nationally recognised tourist attractions or designated sites, cities.
Regional / District	Moderate	Receptor of regional importance and scale with limited potential for substitution or reparation e.g. regional and Council level economy, regional attractions and associated visitors, towns and significant settlements.
District / Local	Low	Receptor of local importance and scale which is difficult to substitute, rare or unusual at a local level e.g. local economy within the LIA, local tourist attractions and businesses, active workers in the LIA.
Local	Very low	Receptor of local importance and scale which is either not vulnerable to change or can be readily substituted.

Table 12.2A: Impact Magnitude

MAGNITUDE	DEFINITION
Major	Irreversible, substantial and permanent impact
Moderate	Considerable and permanent impact
Minor	Temporary and/or reversible impact, or modest permanent impact
Neutral	No discernible impact

- 12.22 An assessment of effect significance has been made as a function of the receptor sensitivity and impact magnitude, as summarised in **Table 12.3A**. Significant effects are considered to be those assessed as having a greater than moderate significance of effect.

Table 12.3A: Significance of Effects Matrix

		RECEPTOR VALUE / SENSITIVITY				
		VERY HIGH	HIGH	MODERATE	LOW	VERY LOW
MAGNITUDE OF CHANGE	MAJOR BENEFICIAL	Major Beneficial	Major-Moderate Beneficial	Moderate Beneficial	Moderate/Minor Beneficial	Minor Beneficial
	MODERATE BENEFICIAL	Major-Moderate Beneficial	Moderate Beneficial	Moderate/Minor Beneficial	Minor Beneficial	Minor/Negligible Beneficial
	MINOR BENEFICIAL	Moderate Beneficial	Moderate/Minor Beneficial	Minor Beneficial	Minor/Negligible Beneficial	Negligible
	NEUTRAL	Negligible	Negligible	Negligible	Negligible	Negligible
	MINOR ADVERSE	Moderate Adverse	Moderate/Minor Adverse	Minor Adverse	Minor/Negligible Adverse	Negligible
	MODERATE ADVERSE	Major-Moderate Adverse	Moderate Adverse	Moderate/Minor Adverse	Minor Adverse	Minor/Negligible Adverse
	MAJOR ADVERSE	Major Adverse	Major-Moderate Adverse	Moderate Adverse	Moderate/Minor Adverse	Minor Adverse

Existing Baseline Conditions**Population and Demographics**

- 12.23 The Site is located to the east of Saffron Walden, within the Uttlesford district of Essex. The Site is located within Ashdon Ward, but is in close proximity to Saffron Walden Castle Ward and Saffron Walden Shire Ward. Saffron Walden is one of four market towns within Uttlesford and is one of the most densely populated areas of Uttlesford. Based on the 2011 census data, Saffron Walden had a resident population of 15,210 people in 2011. Based on population estimates from ONS, the population in Saffron Walden has risen to 17,012 in 2019.
- 12.24 **Table 12.4A** provides the population statistics for the LIA and the wider area. The population within the LIA is estimated to be approximately 21,847 in 2019, growing at approximately 1.3% per year. There are, however, significant variations within the LIA, with Saffron Walden Castle Ward growing at approximately 2.8% per year while Ashdon Ward and Saffron Walden Audley Ward are growing less than 1% per year. The growth of population in the LIA is slightly less than the overall growth of the Uttlesford District, but higher than the regional growth.

Table 12.4A: Population Statistics

DATE	POPULATION				ANNUAL GROWTH RATE SINCE 2011 (%)
	1991	2001	2011	2019	
East of England	5,055,515	5,388,140	5,846,965	6,236,072	0.8
Essex	1,242,241	1,310,835	1,393,587	1,489,189	0.9

DATE	POPULATION				ANNUAL GROWTH RATE SINCE 2011 (%)
	1991	2001	2011	2019	
Uttlesford District	65,432	68,946	79,443	91,284	1.9
LIA (Wards)*					
Ashdon Ward	1,063	1,601	2,040	2,172	0.8
Saffron Walden Audley Ward	2,646	4,575	4,360	4,550	0.5
Saffron Walden Castle Ward	3,766	4,925	3,934	4,808	2.8
Saffron Walden Shire Ward	3,159	5,106	6,983	7,654	1.2
Debden & Wimbish Ward	2,206	2,303	2,407	2,663	1.3
LIA total	12,840	18,510	19,724	21,847	1.3

Source: ONS 1991 Census, 2001 Census, 2011 Census and Population Estimates.

* Note that ward boundaries have changed since 1991.

- 12.25 Ashdon Ward, within which the Site is located, has a relatively sparse population (0.5 persons per hectare) reflecting the rural nature of most of the ward. The Site is located in close proximity to the more densely populated Saffron Walden Shire Ward (15.8 persons per hectare) (ONS, 2011).
- 12.26 **Table 12.5A** provides the age structure of the population within the LIA and the wider area. While overall the population age structure of LIA is comparable to Uttlesford District as well as the regional age structure, there is quite a bit of variation within the wards. Saffron Walden Audley Ward in particular has a comparatively high population of over 65s and a comparatively lower working age population. Debden and Wimbish Ward on the other hand has a comparatively low population of over 65s and a higher working age population.
- 12.27 The population of over 65s in Uttlesford is expected to increase, with a forecasted decrease in the working age population (Organisational Intelligence and ECC, 2016).

Table 12.5A: Age Structure

AGE GROUP	POPULATION (%)							
	ASHDON	SAFFRON WALDEN AUDLEY	SAFFRON WALDEN CASTLE	SAFFRON WALDEN SHIRE	DEBDEN & WIMBISH	UTTLESFORD	ESSEX	EAST OF ENGLAND
0 – 15	383 (18%)	750 (16%)	924 (19%)	1,576 (21%)	519 (19%)	18,134 (20%)	282,266 (19%)	1,212,041 (19%)
6 – 24	194 (9%)	385 (8%)	376 (8%)	607 (8%)	359 (13%)	7,964 (9%)	141,383 (9%)	598,726 (10%)
25 - 49	549 (25%)	1,260 (28%)	1,610 (33%)	2,457 (32%)	988 (37%)	27,723 (30%)	461,583 (31%)	1,973,888 (32%)
50 - 64	569 (26%)	963 (21%)	926 (19%)	1,536 (20%)	426 (16%)	19,533 (21%)	296,390 (20%)	1,212,911 (19%)
65+	477 (22%)	1,192 (26%)	972 (20%)	1,478 (19%)	371 (14%)	17,930 (20%)	307,567 (21%)	1,238,506 (20%)

Source: ONS Population estimates (2019)

Housing Supply and Tenure

- 12.28 The Uttlesford District Council Housing Delivery Test and 5-Year Land Supply Statement (Uttlesford District Council, 2021) identifies a housing requirement of 706 dwellings per year based on the use of the standard methodology for calculating housing supply as set out in Planning Practice Guidance on housing and economic development needs assessments. The Statement calculates that the district has 3.11 years of housing supply for the 2020 – 2025 5-year period, with a deficit of 1,402.
- 12.29 **Table 12.6A** shows that on average the percentage of households in the LIA who own their home outright or via a mortgage is slightly lower than the district or county average, although it is comparable to the regional average. Within the wards there is considerable variation as a higher percentage of households own their homes within Ashdon Ward, while the percentage is much lower in Saffron Walden Audley, Saffron Walden Castle and Debden and Wimbish Wards. There is also a higher rate of social housing in Saffron Walden Audley and Saffron Walden Castle Wards.

Table 12.6A: Housing Tenure

REGION	NUMBER OF HOUSEHOLDS	PERCENTAGE SPLIT (%)*						
		OWNED (TOTAL)	OWNED OUTRIGHT	OWNED WITH MORTGAGE / LOAN	SHARED OWNERSHIP	SOCIAL RENTED	PRIVATE RENTED	LIVING RENT FREE
East of England	2,423,035	68	33	35	1	16	15	1
Essex	581,589	71	35	37	1	14	13	1
Uttlesford	31,316	72	34	38	1	13	13	2
LIA (Wards)								
Ashdon Ward	674	75	37	38	3	11	9	3
Saffron Walden Audley Ward	2,238	66	38	28	1	17	15	2
Saffron Walden Castle Ward	2,009	65	33	32	1	19	14	1
Saffron Walden Shire Ward	2,263	72	32	40	1	12	13	1
Debden & Wimbish Ward	785	61	32	29	1	10	27	1
LIA Average		68	34	33	1	14	16	2
Source: ONS, Census 2011 KS402EW – Tenure								
* Percentages do not add up to 100% due to rounding.								

- 12.30 The Land Registry UK House Price Index indicates that house prices in Essex are higher than the East of England and England regional averages. The cost of an average house is estimated to be 12 times the average income in Uttlesford. There are just under 5,000 affordable rented homes in the Uttlesford (Ark Consultants, 2020). Between 2015/16 and 2019/20 on average approximately 259 additional affordable dwellings were provided per year in Uttlesford

according to the affordable housing supply statistics (Ministry of Housing, Communities and Local Government, 2021). However, the number of rough sleepers across the district has generally stayed low with no rough sleepers identified during the 2018 annual count (Essex County Council, 2019a).

- 12.31 There is provision of supported accommodation for older people in the local area. Based on a review of Care Quality Commission data, there are three care homes for older people within the LIA as shown in **Table 12.7A**.

Table 12.7A: Care Homes within the LIA

NAME	APPROXIMATE DISTANCE FROM SITE (KM)	CARE HOME'S BEDS	REGULATED ACTIVITY - RESIDENTS REQUIRING NURSING OR PERSONAL CARE	SERVICE TYPE - CARE HOME SERVICE WITH NURSING	SERVICE TYPE - CARE HOME SERVICE WITHOUT NURSING	SERVICE USER BAND - OLDER PEOPLE	SERVICE USER BAND - DEMENTIA
Hatherley Care Home Limited	1.2	37	Y	Y		Y	Y
Stanley Wilson Lodge Care Home	1.3	75	Y	Y		Y	Y
Highfield Care Home	1.8	60	Y	Y		Y	Y
Source: Care Quality Commission (2021)							

Education and Skills

- 12.32 There are six day nurseries within the Saffron Walden Ward and one within Ashdon Ward. There are six primary schools and one secondary school within Saffron Walden, as well as four primary schools outside of Saffron Walden but just within 5km of the Site. Information on these schools is provided in **Table 12.8A**. The data indicates that there is some capacity in primary schools within Saffron Walden and the surrounding areas, but that the secondary school is over capacity. The next nearest secondary school is Joyce Frankland Academy in Newport, approximately 5.1km to the south-west, which has existing capacity. Both secondary schools have sixth form provision.

Table 12.8A: LIA Schools Capacity

SCHOOL	TYPE	DISTANCE FROM SITE (KM)	NUMBER OF PUPILS (JAN 20)	CAPACITY
R A Butler Infant School	Primary	1.3	242	270
R A Butler Junior School	Primary	1.3	378	360

SCHOOL	TYPE	DISTANCE FROM SITE (KM)	NUMBER OF PUPILS (JAN 20)	CAPACITY
St Thomas More Catholic Primary School, Saffron Walden	Primary	1.3	206	210
Katherine Semar Junior School	Primary	1.7	253	270
Katherine Semar Infant School	Primary	1.7	179	180
St Mary's Church of England Voluntary Aided Primary School	Primary	1.7	211	210
Saffron Walden County High School	Secondary	2.3	2,104	2,050
Wimbish Primary School	Primary	4.0	95	105
Debden Church of England Voluntary Controlled Primary Academy	Primary	4.6	86	161
Radwinter Church of England Voluntary Aided Primary School	Primary	4.7	127	105
Ashdon Primary School	Primary	4.8	76	105
Total Primary			1,853	1,976
Total Secondary			2,104	2,050
<i>Source: Department of Education (2021)</i>				

- 12.33 The Essex School Organisation Service's 10 year plan suggests that there would be capacity in primary schools within Saffron Walden over the next ten years (2021 - 2030), although it notes that the level of new housing planned in Saffron Walden would lead to a requirement for a new primary school. An application for housing development which has been approved (UTT/16/1856/DFO) to the west of the Site includes the provision of land for a primary school. Land for an extension to the school is also provided by an adjacent housing development which has also been approved (UTT/17/2832/OP). The 10 year plan also suggests that there would be capacity in Joyce Frankland Academy over the next 10 years.
- 12.34 The 2011 Census provides an indication of general qualification levels of the population within the LIA, area and region, as summarised in **Table 12.9A**. On average, the LIA has a higher percentage of people with Level 4 qualifications, and a lower percentage of people with no qualifications. The level of qualifications varies within the wards, with higher Ashdon and Saffron Walden Audley wards having a particularly high percentage of people with Level 4 qualifications.
- 12.35 Across Uttlesford, the percentage of children achieving a good level of development and those achieving at least the expected level across all early learning goals has increased since 2015 and is higher than the average for Essex and England (ECC, 2019a).

Table 12.9A: Educational Attainment

AREA	HIGHEST LEVEL OF QUALIFICATION (%)						
	NONE	1	2	3	4	APPRENTICE	OTHER
East of England	22.5	14.6	16.2	11.8	25.7	3.7	5.4
Essex	23.9	16.1	17.2	11.6	23.0	3.8	4.5
Uttlesford	17.7	13.9	17.2	12.0	31.9	3.3	4.0
LIA (Wards)							
Ashdon Ward	14.8	11.2	17.3	12.6	39.5	2.3	2.3

AREA	HIGHEST LEVEL OF QUALIFICATION (%)						
	NONE	1	2	3	4	APPRENTICE	OTHER
Saffron Walden Audley Ward	16.7	11.0	15.7	10.6	39.6	2.1	4.4
Saffron Walden Castle Ward	20.9	13.1	16.3	11.3	31.6	3.3	3.5
Saffron Walden Shire Ward	18.8	15.3	17.5	12.3	27.3	3.6	5.2
Debden & Wimbish Ward	11.1	13.0	20.8	15.5	33.1	3.1	3.4
LIA Average	16.5	12.7	17.5	12.5	34.2	2.9	3.8

Level 1: 1-4 O levels/CSEs/GCSEs (any grade), Entry Level, Foundation Diploma, NVQ Level 1, Foundation GNVQ, Basic / Essential Skills

Level 2: 5+ O levels / CSEs (Grade 1)/GCSEs (Grades A* - C), School Certificate, 1 A level, 2-3 AS Levels/ VCEs, Intermediate / Higher Diploma, Welsh Baccalaureate Intermediate Diploma, NVQ Level 2, Intermediate GNVQ, City and Guilds Craft, BTEC First / General Diploma, RSA Diploma

Level 3: 2+A levels/ VCEa, 4+AS levels, Higher School Certificate, Progression / Advanced Diploma, Welsh Baccalaureate Advanced Diploma, NVQ Level 3, Advanced GNVQ, City and Guilds Advanced Craft, ONC, OND, BTEC National, RSA Advanced Diploma

Level 4: Degree (e.g. BA, BSc), Higher Degree (e.g. MA, PhD, PGCE), NVQ Level 4-5, HNC, RSA Higher Diploma, BTEC Higher Level, Foundation

Source: ONS, Census 2011 KS501EW - Qualifications and students

Economic Profile

- 12.36 Uttlesford is generally affluent with few areas of deprivation. According to the Index of Deprivation 2019, none of the areas within Uttlesford fall within the 40% most deprived and 8 areas are within the 10% least deprived in the country. Ashdown Ward is within the 40% least deprived neighbourhoods in the country, while Saffron Walden Audley Ward is within the 10% least deprived neighbourhoods as shown in **Table 12.10A**.

Table 12.10A: Indices of Deprivation

LOWER-LAYER SUPER OUTPUT AREAS (LSOA)	RANK*
Uttlesford 001A (Ashdon Ward)	22,961 (40% least deprived)
Uttlesford 001B (Saffron Walden Audley Ward)	32,811 (10% least deprived)
Uttlesford 001C (Ashdon Ward)	26,974 (20% least deprived)
Uttlesford 002D (Saffron Walden Castle Ward)	25,552 (30% least deprived)
Uttlesford 002E (Saffron Walden Shire Ward)	26,351 (20% least deprived)
Uttlesford 002F (Saffron Walden Shire Ward)	26,709 (20% least deprived)
Uttlesford 002G (Saffron Walden Shire Ward)	29,080 (20% least deprived)
Uttlesford 002B (Saffron Walden Audley Ward)	29,240 (20% least deprived)
Uttlesford 004D (Debden & Wimbish Ward)	29,390 (20% least deprived)
Source: Ministry of Housing, Communities & Local Government (2019)	
* Rank out of 32,844 LSOAs in England, in which 1 is the most deprived LSOA.	

- 12.37 Uttlesford has very low rates of children in care and child poverty. However, Saffron Walden Castle Ward has 9.4% - 13.2% of children in low-income families, while Saffron Walden Shire Ward has 7% - 9.3% of children in low-income families. This compares to only 1.7% - 6.9% in Ashdon, Debden and Wimbish Ward and Saffron Walden Audley Wards (Organisational Intelligence and ECC, 2016).
- 12.38 **Table 12.11A** provides data from the 2011 census on the proportion of the population who are economically active and inactive as well as employed and unemployed. The data indicates that Uttlesford and the LIA have a higher percentage of the population that are economically active compared to the regional average. The percentage of the population in employment is also higher and consequently unemployment is lower than the regional average.
- 12.39 There is some variation within the wards, with Debden and Wimbish Ward having a high percentage of the population in employment and relatively low unemployment, as well as low percentage of the population economically inactive. Ashdon Ward on the other hand has a higher percentage of the population in retirement while Saffron Walden Castle Ward has a higher level of unemployment compared to the other wards.

Table 12.11A: Key Economic Activity Data for all Residents Aged 16-74 Years

AREA	ALL USUAL RESIDENTS AGED 16 TO 74	ECONOMICALLY ACTIVE (%)*	ECONOMICALLY ACTIVE: IN EMPLOYMENT (%)	ECONOMICALLY ACTIVE: UNEMPLOYED (%)	ECONOMICALLY INACTIVE (%)**	ECONOMICALLY INACTIVE: RETIRED (%)
East of England	4,245,544	71.6	64.8	3.8	28.4	14.4
Essex	1,011,611	71.1	64.6	3.8	28.9	15.4
Uttlesford	57,086	74.4	69.4	2.7	25.6	13.5
LIA (Wards)						
Ashdon Ward	1,247	72.7	67.8	2.2	27.3	14.0
Saffron Walden Audley Ward	3,388	73.8	68.2	3.0	26.2	13.1
Saffron Walden Castle Ward	3,463	74.6	69.1	3.4	25.4	13.3
Saffron Walden Shire Ward	4,142	77.5	72.1	3.1	22.5	10.4
Debden & Wimbish Ward	1,765	80.1	75.8	2.0	19.9	9.6
LIA Average		75.5	70.6	2.7	24.3	12.1
Source: ONS Census 2011 - KS601EW to KS603EW						
*Includes people in part-time and full-time employment or those who are self-employed						
**Includes people who are retired, students, long-term sick, looking after home and/or family etc						

- 12.40 More recent estimates from the ONS annual population survey indicated that for the year 2020¹ the percentage of economically active population (aged 16-64) in Uttlesford was 77% compared to the East England average of 80%, while the percentage of the population in employment was 75% compared to the East England average of 77%. However, the unemployment rate remains

lower than the East England average (3.7% compared to 3.8%).

- 12.41 The Business Register and Employment Survey (2019) provides data on the number of jobs held by employees broken down by industry, which is shown in **Table 12.12A**. Within Uttlesford, transport & storage (inc postal) and professional, scientific & technical accounts for the greatest proportion of employment. There is significant variation within the LIA.

Table 12.12A: Employment by Industry Sector in 2019

INDUSTRY SECTOR	ASHDON (%)	SAFFRON WALDEN AUDLEY (%)	SAFFRON WALDEN CASTLE (%)	SAFFRON WALDEN SHIRE (%)	DEBDEN AND WIMBISH (%)	UTTLESFORD (%)	ESSEX (%)	EAST OF ENGLAND (%)
Agriculture, forestry & fishing	0.0	0.0	1.0	0.0	0.0	1.1	0.8	0.9
Mining, quarrying & utilities	0.0	0.7	0.0	2.0	0.0	0.9	1.0	1.0
Manufacturing	16.7	2.1	10.0	14.0	12.5	6.8	6.8	7.6
Construction	16.7	1.1	7.5	4.0	11.2	5.7	7.8	6.0
Motor trades	0.0	0.9	1.0	3.0	5.0	1.8	2.7	2.4
Wholesale	0.0	0.4	10.0	8.0	0.0	4.0	4.4	4.3
Retail	4.4	14.3	12.5	14.0	0.0	5.7	9.3	9.2
Transport & storage (inc postal)	12.5	1.7	1.5	1.6	0.0	20.5	5.1	4.9
Accommodation & food services	2.2	8.6	5.0	0.4	18.8	9.1	6.9	6.9
Information & communication	6.7	1.4	5.0	6.0	3.8	2.8	3.4	3.8
Financial & insurance	2.5	6.4	1.0	0.0	0.0	1.8	2.9	2.5
Property	1.1	2.1	1.0	0.8	0.0	1.4	1.9	1.7
Professional, scientific & technical	5.6	12.9	5.0	7.0	5.0	10.2	8.8	9.6
Business administration & support services	11.1	2.1	7.5	4.0	6.2	6.8	8.1	10.2
Public administration & defence	0.0	10.0	0.0	0.4	12.5	2.8	3.1	3.3
Education	5.0	10.0	10.0	10.0	12.5	6.8	9.2	9.2
Health	10.0	5.0	20.0	14.0	2.5	5.7	13.2	11.9
Arts, entertainment, recreation & other services	2.2	14.3	7.5	6.0	7.5	3.4	4.6	4.5
Source: ONS Business Register and Employment Survey (2020)								

Recreation, Leisure and Tourism

- 12.42 Saffron Walden is a medieval town with a rich heritage of historic buildings. The Visit Saffron Walden tourist website highlights a number of attractions including the Saffron Walden Museum, Audley End House and Gardens, Bridge End Garden, Fry Art Gallery, Saffron Hall and One Minet Skate Park.
- 12.43 Indoor leisure facilities include Lord Butler Leisure Centre, which has a 4-court sports hall, a main and teaching pool, two squash courts and the largest health and fitness facility in the District. Adjacent to the leisure centre is the Turpin's Indoor Bowls Club. Facilities for community sports are also provided by some of the schools in Saffron Walden, including Dame Bradbury School (independent school) and Saffron Walden County High Sports Centre (Knight, Kavanagh & Page Ltd, 2019a). Saffron Walden also has 13 football pitches, 2 grass rugby pitches, 3 cricket pitches, 1 hockey pitch, 7 locations for tennis and 2 locations for netball. However, there is a shortfall of football, cricket and rugby provision based on current and/or future demand (Knight, Kavanagh & Page Ltd, 2019b).
- 12.44 UDC's Open Space Assessment (Knight, Kavanagh & Page Ltd, 2019c) identified the following open space provision within Saffron Walden:
- Five parks and gardens, one of which is rated as low quality while the rest are rated as high quality and high value;
 - Three natural and semi-natural greenspaces, one of which is rated as low quality, while the rest are rated as high quality and high value;
 - Eleven amenity greenspaces, three of which are rated as low quality, one rated as low value and the remaining rates as high quality and high value;
 - Six provisions for children and young people, three of which are rated as low quality, with the remainder rated as high quality and high value; and
 - Five allotments, two of which are rated as low value, while the rest are rated as high quality and high value.
- 12.45 Out of seven sites classed as parks and gardens in Uttlesford, five are located within Saffron Walden. The largest is The Common (5.53ha) followed by Bridge End Garden (3ha). Both sites were the highest scoring sites in terms of quality. An online survey carried out for the Open Space Assessment found that these two sites along with Audley End House and Gardens were one of the most frequently visited sites by respondents. Two amenity greenspaces (Blacklands Avenue and Seven Devils Lane and Anglo American Playing Fields) within Saffron Walden were also rated as within the four highest scoring in terms of quality. The Saffron Walden Skate Park was the highest scoring site for quality and value in terms of provision for children and young people.
- 12.46 The UDC Open Space Study Standards Paper (Knight, Kavanagh & Page Ltd, 2019d) identifies deficiencies and surpluses in open space provision. The provision in Saffron Walden in terms of open space per 1,000 population is shown in **Table 12.13A**. Saffron Walden was assessed to have sufficient current provision of parks and gardens and allotments when compared to the recommended quality standards for Uttlesford, but a shortfall of natural and semi-natural greenspace, amenity greenspace and play provision. Compared to the Fields in Trust (FIT) Guideline Standards, there is a shortfall in provision of parks and gardens and natural and semi-natural greenspace.

Table 12.13A: Open Space Provision within Saffron Walden Compared to Recommended Standards

OPEN SPACE TYPE	HECTARES PER 1,000 POPULATION		
	CURRENT PROVISION	RECOMMENDED QUALITY STANDARDS	FIT GUIDELINE STANDARDS
Parks and gardens	0.53	0.1	0.8
Natural and semi-natural greenspace	0.07	5.81	1.8
Amenity greenspace	0.8	1.6	0.6
Allotments	0.32	0.2	0.25
Play provision	0.08	0.1	-

- 12.47 No PRoW are registered crossing the Site. The nearest PRoW is located to the north of the Site, on the other side of Radwinter Road, which eventually joins with Redgates Lane. There is also a large network of PRoWs in the wider area to the east of the Site.

Health

- 12.48 It is considered that the majority of the baseline information provided above also aids in outlining the existing wider health baseline to the area. In addition, this section looks at some indicators more directly linked to health. A high level review of the PHE website shows the population of Uttlesford compares favourably in some health indicators, 74.7% of people are physically active compared with a national average of 66.9% and a regional average of 69.7%. Similarly, the percentage of adults classified as obese or overweight is comparatively favourable with Uttlesford having 57.6% compared with the national average of 63.3% and a regional average of 66.6%.

Life Expectancy

- 12.49 The PHE website also shows that the average male life expectancy at birth for Uttlesford is 82.9 years, which is favourable when compared with the regional average of 80.5 years and the national average of 79.8 years. Similarly, for females the Uttlesford, the average life expectancy at birth is 85.8 years, which is higher than the regional average of 83.9 years and the national average of 83.4 years.

Access to Healthcare

- 12.50 Uttlesford is located within the West Essex Clinical Commissioning Group (CCG). According to data from a 2018 survey, 80.2% of patients in the West Essex CCG reported a positive experience of their GP practice. This is lower than the average for both England (83.75%) and the NHS Eastern Region (83.3%) but is in line with the combined average for all CCGs in Essex (80.3%) (ECC, 2019a).
- 12.51 There are two GP surgeries and two dental practices within 5km of the Site. There is a community hospital in Saffron Walden, however, the closest large hospital with accident and emergency is at Addenbrookes, Cambridge, approximately 19km away. **Table 12.14A** details healthcare facilities within 5km of the Proposed Development.

Table 12.14A: Healthcare Facilities within 5km

TYPE	NAME	APPROX. DISTANCE FROM SITE (KM)*	NO OF REGISTERED PATIENTS	TOTAL GP HEADCOUNT	ACCEPTING NEW PATIENTS
GP	The Gold Street Surgery	1.7	10,593	9	Yes
	Crocus Medical Practice	1.8	12,973	11	Yes
Dentist	Courtyard Dental Practice	1.4	-	-	-
	The Walden Dental Clinic	1.8	-	-	-
Hospital	Saffron Walden Community Hospital	0.6	-	-	-
<i>Source: NHS, NHS Digital (2021)</i>					

- 12.52 Although both GP surgeries are accepting new patients, it's noted from a consultation response by West Essex CCG with regard to a nearby development, that based on their calculations, both surgeries do not have spare capacity (West Essex CCG, 2020).

Climate Change

- 12.53 Climate change could have an impact on health and healthcare facilities. Climate change may result in an increase in the frequency and intensity of heatwaves. The "UK Climate Change Risk Assessment 2017" (Committee on Climate Change, 2016) estimates that heat-related deaths in the UK could more than double by the 2050s. While there is predicted to be some decline in cold-related deaths, it is only predicted to decrease slightly. The risk assessment noted that hospital and GP visits increase in hot weather. There is also the possibility of an increase in infectious diseases and pests due to rising temperature. Climate change may, therefore, increase pressure on local health facilities.
- 12.54 The climate change risk assessment also notes that in addition to the risk of accidents due to flooding, there is also emerging evidence of the impacts of flooding on mental health, which could also result in additional pressure on local health facilities. Increased flooding may also result in disruption of health services and access to health facilities, as well as economic cost. The June 2021 Flood Risk Assessment, undertaken by Cotswold Transport Planning Ltd, concludes that the Site is located within Flood Zone 1 and is at low/negligible risk of flooding. Therefore, as the risk of flooding from the Site is low, it is not expected that there will be a significant risk of increasing pressure on health services as a result of flooding events.

Evolution of the Baseline Conditions without Development

- 12.55 It is anticipated that in the absence of the Proposed Development the local, regional and national population will continue to grow and age. However, the rate and distribution of growth and demographic change are complex and difficult to predict, affected by a range of factors within the private and public sectors including: housing provision, infrastructure and public service provision; and public policy.

- 12.56 The dynamic modelling that would be required to provide a range of likely baseline evolution scenarios is beyond the reasonable scope of this assessment and would, in any event, contain uncertainty and potential counterfactuals. Therefore, to provide a reasonably practicable method for assessment a static or unchanging baseline has been assumed.

Predicted Impacts

Construction Phase

Direct, Indirect and Induced Employment

- 12.57 The Proposed Development would create a number of temporary jobs during the construction phase, which is anticipated to last approximately seven years. The construction phase would also result in indirect jobs created through the supply chain, and potentially a further number of induced jobs because of spend of earnings of those employed in the works on-site or in its supply chain.
- 12.58 Based on an estimated Proposed Development GVA of approximately £33 million and average gross output per construction industry employee of £48,750 (Rhodes, 2019) the number of job years for the Proposed Development is estimated to be 671. Over an estimated 7 year build program this is equivalent to the creation of 67 Full Time Equivalent (FTE) jobs during the construction phase.
- 12.59 Construction of the Proposed Development would also result in indirect jobs created through the supply chain, and potentially a further number of induced jobs because of spend of earnings of those employed in the works on-site or in its supply chain. It is estimated that for every construction job created 1.2 indirect and induced jobs are created elsewhere in the supply chain and wider economy induced (Lichfields and Home Builders Federation, 2018 and Investment and Performance Board, 2014, noting a range of multipliers are available and the lowest from these documents has been used as a conservative estimate), giving a total additional 81 FTE jobs during the construction phase. However, due to substitution and displacement effects the overall job contribution is likely to be lower than this figure (a quantitative assessment of this is beyond the scope of this assessment).

Health

- 12.60 Other chapters within [this the original ES and this Addendum](#), namely Transport (Chapter 13), Air Quality (Chapter 7) and Noise and Vibration (Chapter 10) have outlined expected health impacts during construction in respect of each individual environmental topic. Predicted significant health impacts during construction include:
- The potential for dust emissions to occur during construction activities. Dust emissions can lead to or exacerbate respiratory disorders but any impacts would be short-term in duration and temporary; and
 - The potential for noise emissions to occur. Noise emissions can lead to increased levels of stress and anxiety which can harm physical and mental health and wellbeing.
 - The potential for vibration impacts to occur. Vibration emissions can lead to increased levels of stress and anxiety which can harm physical and mental health and wellbeing. The HUDU Rapid HIA checklist (see [Appendix 12.1 of the original ES](#)) notes that construction works will be undertaken in line with current best practice measures to prevent or mitigate the level of impacts relating to dust, noise and vibration.

- 12.61 A number of mitigation measures have been identified in respect of construction dust, noise and vibration.

Operational Phase

Population

- 12.62 The Proposed Development would result in an increase in population of the local area, which in turn would increase demand on public services. The direct effects of an increase in population are largely subjective and relative to the size of the wider population. An estimate of the potential increase in population on completion of the Proposed Development, has been made in **Table 12.15A** based on 2011 census information on average household size within the LIA. This is based on the assumption that all residents of the new residential dwellings will be new residents from outside the local area.
- 12.63 The Proposed Development on completion would result in an increase of approximately ~~58404~~ people, which represents an increase of approximately ~~2.93.4~~% of the population in Saffron Walden and ~~2.3~~ 2.7% increase of the population within the LIA (based on 2019 population estimates).

Table 12.15A: Estimated New Residents

RESIDENTIAL UNIT TYPE	NUMBER (INDICATIVE)	AVERAGE HOUSEHOLD SIZE*	ESTIMATED RESIDENTS
One bedroom flat	3415	1.4	4321
Two bedroom flat	3012	1.9	5823
Two bedroom house	7338	1.9	13872
Three bedroom house	7893	2.6	200239
Four bedroom house	2454	3.0	62160
Five bedroom house	21	3.3	69
Total	233	-	504584
* Source: ONS Census 2011 - DC4405EW - Tenure by household size by number of bedrooms			

Housing Supply

- 12.64 Based on completion of 40 units a year, this would equate to approximately 5.7% of the annual target of 706 dwellings a year. The Proposed Development is likely to include a mix of one and two bedroom flats and two to ~~four~~ five bedroom houses, providing a diverse supply of dwellings and increasing choice and availability of housing in the district. The exact mix of market housing units would be fixed through the reserves matters applications following outline planning permission.
- 12.65 The Proposed Development includes for 40% affordable housing, consisting of affordable rented accommodation (28%) and shared ownership properties (12%). The baseline review identified that the cost of an average house in the district far exceeds the average income, indicating the need for affordable housing. The Proposed Development's provision of affordable housing would increase the quantity of affordable housing which would help to address the accommodation needs of residents not able to afford the house prices within the district.

Economic Growth and Employment

- 12.66 The Proposed Development would provide 233 new households. Each household would be expected to spend a proportion of their household income in the local area on a wide range of goods and services. It is estimated that, on completion, total annual household expenditure

would be £7.3 million based on an average weekly household spend of £603 in the UK in the financial year ending 2019 (ONS Family spending in the UK, 2021). Whilst publicly accessible information on the distribution of household spending is not available, it is reasonable to assume a proportion of this spending will be captured within the local economy and contribute to job generation.

- 12.67 The Proposed Development is also estimated to house approximately ~~3564~~15 new working age (16 to ~~75~~4year olds) people, which is approximately 0.~~78~~% of the employed people in the district. Whilst specific employment outcomes are difficult to predict and a portion of the residents would have moved from within the district, it is anticipated that some new staff will become available for a range of industries including public services.

Public Services - Education

- 12.68 The Proposed Development would increase demand for educational facilities. The Essex School Organisation Service's 10 year plan forecasting methodology uses the following factors to forecast likely demand for school places created by new development:
- New house - 0.3 additional primary school pupils and 0.2 additional secondary school pupils;
 - New flat - 0.15 additional primary school pupils and 0.1 additional secondary school pupils; and
 - One-bedroom units – no additional school pupils.
- 12.69 In addition, the ECC Developers' Guide to Infrastructure Contributions (2019b) also provides a factor of 0.09 per flat and 0.045 per house for early years and childcare and 0.01 per one bedroom flat, 0.02 per two bedroom flat and 0.04 per house for post 16 year old education.
- 12.70 Based on these factors, the completed Proposed Development would create the need for approximately
- 10 additional early years and childcare provision;
 - ~~5664~~ additional primary school;
 - ~~3742~~ additional secondary school places; and
 - ~~89~~post 16 years old education.
- 12.71 It should be noted that the demand would not arise all at once but would be staggered over the construction period, as approximately 40 units would be completed per year.
- 12.72 The Essex School Organisation Service's 10 year plan suggests that there would be capacity in secondary schools and primary schools over the next ten years, although a new primary school may be required to meet the demand from new housing. Land for provision of a new primary school has been included in the housing development schemes (UTT/16/1856/DFO and UTT/17/2832/OP) located just to the west of the Site.
- #### Health – HUDU Rapid HIA checklist
- 12.73 The HUDU Rapid HIA checklist included in **Appendix 12.1 of the original ES** has considered the potential health impacts as a result of the Proposed Development across eleven key topic areas. Across the eleven topics of focus, none of the relevant health considerations are expected to see a negative impact. A large number of the points considered do have minor

positive or neutral benefits for existing and new residents in areas such as housing design and inclusivity, and access to open space (see below).

- 12.74 As previously outlined, other chapters within ~~this~~ the original ES and this Addendum have considered impacts in areas that may affect Human Health i.e. Transport (Chapter 13), Air Quality (Chapter 7) and Noise and Vibration (Chapter 10). However, none of these chapters list any potential significant health impacts during the operational phase of the Proposed Development.

Public Services - Healthcare Facilities

- 12.75 The Proposed Development would result in approximately ~~504~~84 new residents, which is an increase of approximately 0.2% of the population within the West Essex CCG and an increase of 2.45% of the registered patients at GP surgeries within 5km of the Site. This will result in additional pressure on the local health service provision.

Open Space

- 12.76 The Masterplan for the Proposed Development provides for significant new green infrastructure and recreational facilities for the existing and new communities. The Masterplan includes for approximately 10 ha of public open space, which accounts for approximately 55% of the Site. The public open space includes for formal open space with play areas, parkland, a central green corridor with informal play and pedestrian / cycle links. Pedestrian and cycle links are proposed to run around the periphery of the Site as well as within the green corridor and parkland.
- 12.77 These features would provide benefits at a local level for the existing and new communities. The green spaces and play areas would also indirectly bring beneficial health and wellbeing benefits, helping to meet local health priorities in terms of increasing use of the local natural environment, ensuring more children are at a healthy weight and encouraging daily activity.

Crime Reduction and Safety

- 12.78 The masterplan for the Proposed Development has been designed to minimise the potential for crimes to occur and the use of active frontages and overlooking of key spaces should minimise the potential for crime. Similarly measures to promote security and safety have been included within the final masterplan again promoting safety throughout the development. Overall it is therefore considered that the Proposed Development would help to design out crime and increase the perception of safety.

Evaluation of Predicted Impacts

Construction

Direct, Indirect and Induced Employment

- 12.79 The creation of construction jobs and the indirect and induced employment over the seven year construction period would provide employment at a district or regional level (i.e. moderate receptor). The employment impacts would be medium-term and temporary as well as low in terms of employment numbers and, therefore, of minor magnitude. The effects of the Proposed Development on employment creation would be of **minor beneficial** significance.

Health

- 12.80 The significant impacts to human health discussed within other chapters are summarised as follows:

- The potential for dust emissions to occur during construction activities could affect sensitive receptors i.e. human health. However, the risk magnitude to human health as a result of dust emissions is predicted to be either 'low risk' or '**negligible**' and any impacts would be temporary and would occur over a short-term duration.
- The potential for noise emissions to occur - a high magnitude of impact was predicted at Turnip Hall Farm, a highly sensitive receptor when construction works are undertaken close to the Site boundary. It is, however, noted that the impact would be temporary in nature and would only occur for a short duration.
- The potential for vibration impacts to occur - vibration compaction works undertaken close to the Site boundary are predicted to result in a moderate magnitude of impact for Turnip Hall Farm. When combined with a high sensitivity receptor (i.e. Turnip Hall Farm) this would result in a **moderate adverse** effect which is significant. It is, however, noted the impact would be temporary in nature and would only occur for a short duration.

Operation Phase

Population

- 12.81 The small increase in the population in the local area would be of minor magnitude. The sensitivity of the receptor is low. The direct long term effects of the increased population would be of **minor adverse** significance.

Housing Supply

- 12.82 The Proposed Development would make a valuable contribution to the housing supply in the district. In particular, the Proposed Development's provision of affordable housing would increase the quantity of affordable housing which would help to address the accommodation needs of residents not able to afford the house prices within the district. The permanent direct impact of additional housing would be of minor / moderate magnitude on a receptor of moderate value. The effects of the Proposed Development on housing provision would be of **moderate / minor** beneficial significance.

Economic Growth and Employment

- 12.83 The increase in local spending and contribution of employees is relatively small, but would be a long term / permanent impact. The magnitude of impact would be minor on a low value receptor. The effect is considered to be of **minor beneficial** significance.

Public Services - Education

- 12.84 The Proposed Development would result in increased demand on educational facilities in the local area. As the baseline review indicated that there is capacity within primary and secondary schools, the magnitude of the increase in demand is considered to be minor. The effect of the Proposed Development on educational facilities in the local area / district (low value receptor) is considered to be of **minor adverse** significance.

Health – HUDU Rapid HIA checklist

- 12.85 For all of the topics considered within the HUDU Rapid HIA checklist the potential impacts are expected to be minor/neutral in magnitude. The effects will be long term permanent and irreversible and are considered to be of **minor beneficial** significance.
- 12.86 No significant impacts to human health during the operational phase of the Proposed Development have been identified within other topics within this ES.

Public Services - Healthcare Facilities

- 12.87 The Proposed Development would result in permanent increased demand on healthcare facilities in the local area. As the Proposed Development would result in an increase of approximately 0.2% of the population within the West Essex CCG and an increase of 2.1% of the registered patients at GP surgeries, the magnitude of the increase in demand is considered to be minor. The effect of the Proposed Development on healthcare facilities in the local area and region (moderate value receptor) is considered to be of **minor adverse** significance.

Open Space

- 12.88 The Proposed Development would provide public open space for residents of the development and the existing local community. The direct permanent impact is considered to be positive and of minor magnitude. Therefore the effect on the local (low value) receptor would be of **minor beneficial** significance.

Crime Reduction and Safety

- 12.89 The measures included in the final design of the Proposed Development will help to design out crime and increase the feeling of safety for residents and visitors alike. The direct permanent impact is considered to be positive and of minor magnitude. Therefore, the effect on the local (low value) receptor would be of **minor beneficial** significance.

Mitigation

- 12.90 No significant effects are predicted in relation to socio-economic considerations and, therefore, no additional mitigation is required.
- 12.91 Mitigation measures for potential human health impacts relating to Transport (Chapter 13), Air Quality (Chapter 7) and Noise and Vibration (Chapter 10) are detailed within those respective chapters. Mitigation will include:
- A site specific CEMP will be written and will contain mitigation measures recommended within the Institute of Air Quality Management guidance; and
 - A range of mitigation measures aimed at removing or reducing the potential impacts of noise and vibration would also be included in the aforementioned CEMP.

Residual Effects

- 12.92 In the absence of any mitigation for socio-economics, the residual effects are the same as the predicted effects.
- 12.93 Following implementation of the aforementioned mitigation for dust, no significant impacts are expected in relation to Human Health.
- 12.94 With regards to noise and vibration, a moderately significant adverse impact is expected to occur as a result of noise and vibration emissions for one sensitive receptor (Turnip Hall Farm) when construction works are being undertaken at the edge of the Site closest to this receptor. However, this is expected to be a short-term and temporary impact to human health for residents at this receptor.

Cumulative Effects

- 12.95 Six consented and planned developments in a 2km radius of the Proposed Development have been considered in relation to possible cumulative effects. This includes 5 residential developments, providing approximately 732 residential units and a 70 bed care home and 49 retirement apartments (not including the Proposed Development).
- 12.96 The consented and planned residential developments would provide considerable benefit in terms of meeting the housing needs in the district and providing temporary employment during the construction phases. The 70 bed care home would also provide for some employment during the operation phase. Nevertheless, the combined developments would also result in additional pressure on existing public infrastructure such as educational and health facilities.
- 12.97 **Table 12.16A** details the cumulative developments considered.

Table 12.16A: Cumulative Developments

DEVELOPMENT	NO OF UNITS	ESTIMATED POPULATION*	ESTIMATED PRIMARY SCHOOL CHILDREN	ESTIMATED SECONDARY SCHOOL CHILDREN
Land South of Radwinter Road (UTT/16/1856/DFO)	230	552	69	46
Land South of Radwinter Road (UTT/20/2007/FUL)	49 retirement apartments and 70-bed care home	168	0	0
Land North of Shire Hill Farm (17/2832/OP)	100	240	30	20
Land East of Thaxted Road (18/0824/OP & 19/2355/DFO)	150	360	45	30
Land at Ashdon Road UTT/13/2423/OP	167	401	50	33
Land East of Little Walden Road (UTT/16/2210/OP)	85	204	26	17
Proposed Development	233	504 84	56 64	37 42
Total	1,014	2,426 2,509	276 84	183 8
* Based on an average 2.4 people per dwelling for the cumulative developments apart from the retirement apartments (assumed to be two people per apartment) and care home.				

- 12.98 The cumulative developments combined with the Proposed Development would result in an increase in approximately 2,426,509 residents and approximately 27,684 primary school children and 1,838 secondary school children. Two of the cumulative developments (UTT/16/1856/DFO and 17/2832/OP) include the provision of land for a primary school, while the other cumulative developments include for financial contributions towards education provision. The majority of the cumulative developments also include for financial contributions towards healthcare.

- 12.99 With the inclusion of land for primary school provision and financial contributions towards education and healthcare, no significant cumulative effects are predicted.

Monitoring

- 12.100 As no significant effects are predicted which require mitigation, no monitoring is necessary. **Table 12.17** provides a summary of the socio-economic impacts.

Table 12.17A: Summary of Impacts: Socio-Economics

DESCRIPTION OF IMPACT	GEOGRAPHICAL IMPORTANCE	RECEPTOR SENSITIVITY	MAGNITUDE	IMPACT BEFORE MITIGATION				MITIGATION	IMPACT AFTER MITIGATION (RESIDUAL)								
				ADVERSE/BENEFICIAL	REVERSIBLE/IRREVERSIBLE	SHORT-TERM/ LONG TERM	SIGNIFICANCE		ADVERSE/BENEFICIAL	REVERSIBLE/IRREVERSIBLE	SHORT-TERM/ LONG TERM	SIGNIFICANCE					
Construction																	
Direct, indirect and induced employment				Reg / Dist	Mod	Min	Ben	Rev	ST	Min	Not applicable			Ben	Rev	ST	Min
Operation																	
Population increase				Loc	Low	Min	Adv	Irrev	LT	Min	Not applicable			Adv	Irrev	LT	Min
Housing provision				Dist / Loc	Mod	Mod/Min	Ben	Irrev	LT	Mod/Min	Not applicable			Ben	Irrev	LT	Mod/Min
Increase in economic growth and employment				Dist / Loc	Low	Min	Ben	Irrev	LT	Min	Not applicable			Ben	Irrev	LT	Min
Increase demand in education				Dist / Loc	Low	Min	Adv	Irrev	LT	Min	Not applicable			Adv	Irrev	LT	Min
Increase demand for healthcare				Reg / Dist	Mod	Min	Adv	Irrev	LT	Min	Not applicable			Adv	Irrev	LT	Min
Open space				Loc	Low	Min	Ben	Irrev	LT	Min	Not applicable			Ben	Irrev	LT	Min
Crime Reduction and Safety				Loc	Low	Min	Ben	Irrev	LT	Min	Not applicable			Ben	Irrev	LT	Min

Key:

Reg: Regional Loc: Local Adv: Adverse Min: Minor Rev: Reversible LT: Long Term
Dist: District Neg: Negligible Mod: Moderate Ben: Beneficial Irrev: Irreversible ST: Short Term

Transport

13

13.0 Transport

- 13.1 Further transport information is provided relating to the introduction of Electric Vehicle Charging to the Proposed Development, alongside updated base traffic data. This information is provided within a Technical Note appended to this Addendum (see **Appendix 13.2A**). However, the content of this further information does not impact the original assessment work or require any further changes to the original ES Chapter as part of this Addendum. Consequently, Chapter 13 of the submitted ES, dated August 2021, remains unchanged and valid.
- 13.2 With respect to the additional base traffic data summarised in **Appendix 13.2A**, this validates the assumptions made by the original assessment work. Peak hour traffic flows have fallen or remained more or less constant throughout the town with little evidence to suggest that there has been any significant traffic growth between 2017/18 (original assessment data assumptions) and 2021 in line with normal traffic growth forecasts.
- 13.3 This reinforces the robustness of the base flows and junction capacity assessments presented in the original ES Chapter and its supporting TA (**Appendix 13.1 of the original ES**). This additional traffic data supports and further validates the overriding conclusions of the original assessment as contained in the original ES that the residual cumulative impact of the Proposed Development on the road network will not be severe.

Climate Change

14

14.0 Climate Change

Introduction

- 14.1 This chapter provides an assessment of the likely significant effects of the Proposed Development both on and vulnerability to climate change during the construction and operational phases. The requirement to address climate change has been introduced by the EIA Regulations with a specific requirement to the following:
- The impact of the Proposed Development on climate through for example the nature and magnitude of greenhouse gas (GHG) emissions, defined as climate change mitigation and forms Section 1 of this Chapter; and,
 - The vulnerability of the Proposed Development to climate change, defined as climate change adaptation and forms Section 2 of this Chapter.
- 14.2 The assessments have been broadly undertaken in accordance with the Institute of Environmental Management and Assessment (IEMA) Climate Change Resilience and Adaptation Guidance (IEMA, 2020) as well as the 'Assessing Greenhouse Gas Emissions and Evaluating Their Significance', 2017 undertaken by IEMA and Mott MacDonald. Where guidance was not available professional judgement, where required was applied.

Section 1

- 14.3 The scope of the assessment was based on previous and where available, existing GHG emissions rates for the local, regional and national study areas. The information was therefore gathered from a variety of sources, including the Local Planning Authority and Government sources. The assessment of effects derived from the Proposed Development was therefore undertaken against the identified emission rates.

Section 2

- 14.4 The scope of the assessment for the vulnerability of the development to climate change considers the effect of climate change on the development and the in-combination effects of climate change on the environmental receptors. This has been assessed during both construction and operational stages of the Proposed Development and included assessment of climatic predictions identified by UKCP18.

Potential Impacts

- 14.5 As outlined above, effects associated with climate change are broken down into two separate scopes:
- a) Effect on climate change associated with emissions of GHG – GHG emissions have an effect on climate change during the construction works through emissions associated with materials used, energy used and transport involved. During the operational phase, the effect on climate change relates to direct GHG emissions associated with the operation of the development through energy demand and generation and transportation.
 - b) Effect on the development as a result of climatic changes – This relates to direct vulnerability of the development during both construction and operational phases to climatic changes, including, extreme weather events, flooding, shortages of water etc.

- 14.6 Climate change was scoped out in the formal scoping request which was sent to Uttlesford District Council (UDC) in March 2021 on the basis that no significant effects are likely to arise as a result of the development. However, UDC did not agree with this assessment and requested that the Environmental Statement (ES) is supported by a Climate Change Chapter and, therefore, this assessment supports the ES Addendum.
- 14.7 Comments provided by UDC and statutory consultees are outlined in **Table 2.6** of Chapter 2 of the Original ES. Relevant comments to Climate Change can be found in **Table 14.1A** below:

Table 14.1A: Comments Provided by Statutory and Non-statutory Consultees in Relation to Climate Change

CONSULTEE	COMMENT	HOW THIS HAS BEEN ADDRESSED
Natural England 7th April 2021	The England Biodiversity Strategy published by Defra establishes principles for the consideration of biodiversity and the effects of climate change. The ES should reflect these principles and identify how the development's effects on the natural environment will be influenced by climate change, and how ecological networks will be maintained. The NPPF requires that the planning system should contribute to the enhancement of the natural environment 'by establishing coherent ecological networks that are more resilient to current and future pressures' (NPPF Paras 170 and 174), which should be demonstrated through the ES.	The potential effects associated with the development on biodiversity and its relation to climate change have been considered throughout this assessment. The England Biodiversity strategy has been considered throughout the master planning stages of the development. Effects associated with strategic ecology, flora and fauna are assessed in Chapter 8: Ecology.
Uttlesford District Council Scoping Opinion 16th September 2021	Climate change is proposed to be scoped out, however UDC insist that this should be scoped in. In a change from the 2011 EIA Regulations, the 2017 EIA regulations make several references to climate change and sustainability, see Schedule 4, and it should be given consideration. UDC have declared a Climate Change emergency and the Interim Climate Change Policy has been introduced this year. Given the scale of the development it is considered that climate change should be assessed, and cross referenced in relevant chapters in the ES and other relevant documents.	Effects associated with climate change in relation to both, GHG emissions and climate resilience are considered within this chapter and are based on national as well as well UDC's climate emergency and policies.

Methodology – Legislations and Policies

Policy Background and Key Legislation

EIA Directive & Key Legislation

- 14.8 EU Directive 2014/52/EU amends EIA Directive 2011/92/EU which was transposed into UK law in May 2017 by the Town and Country Planning (Environmental Impact Assessment)

Regulations. The Directive introduced clear references to the assessment of climate change effects.

The Town and Country Planning (Environmental Impact Assessment Regulations) 2017

- 14.9 Schedule 4 of the EIA Regulations (Section 5) outlines that the likely significant effects of the development on the environment in relation to the impact of the project on climate (for example the nature and magnitude of greenhouse gas emissions) and the vulnerability of the project to climate change should be assessed where relevant.

Climate Change Act (2008)

- 14.10 The Climate Change Act 2008 forms part of the UK government's plan to reduce GHG emissions, committing the Government to a reduction of GHGs by at least 80% of 1990 levels by 2050. The Act established a framework to develop an economically credible emissions reduction path and strengthened the UK's leadership internationally by highlighting the role it would take in contributing to urgent collective action to tackle climate change under the Kyoto Protocol.
- 14.11 Key provisions of the Act in respect to climate change mitigation include the requirement for the Government to set legally binding 'carbon budgets' capping the amount of GHGs emitted in the UK over a five-year period. The UK is the first country to set legally binding carbon budgets for which five carbon budgets have been put into legislation and run up to 2032.
- 14.12 The Committee on Climate Change was set up to advise the Government on emissions targets, and report to Parliament on progress made in reducing GHG emissions. It includes the Adaptation Sub-Committee (ASC) which scrutinises and advises on the Government's programme for adapting to climate change.

Net Zero Strategy: Build Back Greener

- 14.13 In October 2021 the UK government published the Net Zero Strategy. Produced before COP26 in Glasgow, the report outlines the transition to a low carbon economy. This outlines the UK's movement to be powered by green electricity, to ensure the reduction of emissions to as close to zero as possible.

The Carbon Plan – Delivering our Low Carbon Future

- 14.14 In 2011, the Government published an updated Carbon Plan setting out how the UK will achieve decarbonisation within the framework and make a transition to a low carbon economy while maintaining energy security and minimising costs to consumers. It sets this objective within a framework of mitigating and adapting to climate change and maintaining energy security in a way that minimises costs and maximises benefits to the economy.

National Planning Policy Framework

- 14.15 The National Planning Policy Framework (NPPF) was updated in July 2021. Mitigating and adapting to climate change is outlined as key to the environmental objective encompassing the aspiration for sustainable development.
- 14.16 Section 14 focuses on 'Meeting the challenge of climate change, flooding and coastal change', outlining that new development should be planned for in ways that:
- a) avoid increased vulnerability to the range of impacts arising from climate change. When new development is brought forward in areas which are vulnerable, care should be taken to

ensure that risks can be managed through suitable adaptation measures, including through the planning of green infrastructure; and,

- b) can help to reduce Green House Gas emissions, such as through its location, orientation and design. Any local requirements for the sustainability of buildings should reflect the Government's policy for national technical standards.

The National Adaptation Programme and the Third Strategy for Climate Adaptation Reporting (2018)

- 14.17 The second National Adaptation Programme (NAP) sets out Government's response to the second Climate Change Risk Assessment showing the actions government is and will be taking to address the risks and opportunities posed by a changing climate. It forms part of the five-yearly cycle of requirements laid down in the Climate Change Act 2008 to drive dynamic and adaptive approach to building our resilience to climate change.

- 14.18 The programme outlines the following visions relevant to the Proposed Development:

Chapter 2: Natural Environment – *"The natural environment with diverse and healthy ecosystems, is resilient to climate change, able to accommodate change, and valued for the adaptation services";*

Chapter 3: Infrastructure – *"An infrastructure network that is resilient to today's natural hazards and prepared for the future changing climate";*

Chapter 4: People and the Built Environment – *"To promote the development of a healthy, equitable and resilient population, well placed to reduce the harmful health impacts of climate change, and able to capitalise on the potential health gains associated with tackling it";*

"A health service, a public health and social care system which are resilient and adapting to a changing climate";

"Buildings and places (including built heritage) and the people who live and work in them are resilient and organisations in the built environment sector have an increased capacity to address the risks and make the most of the opportunities of a changing climate"; and,

"Emergency services and local resilience capability take account of and are resilient to a changing climate"

- 14.19 To achieve the vision mentioned in Chapter 4, the following 25-year goals have been set:

"To reduce the risk of harm to people, the environment and the economy from natural hazards including flooding and coastal erosion by taking appropriate action";

"To provide 'clean and plentiful water' for future generations. To increase water supply and incentivise greater water efficiency to maintain a plentiful supply as demand increases and climate change impacts availability"; and,

"To green out towns and cities by creating green infrastructure and planning one million urban trees. Create more, better quality and well-maintained green infrastructure and embed an environmental net gain principle for development, including housing and infrastructure".

England Biodiversity Strategy 2020 (Defra, 2020)

- 14.20 Biodiversity 2020 is a national strategy for England's wildlife and ecosystem services and was published in summer 2020. It sets out the Government's ambition to halt overall loss of England's biodiversity, support healthy well-functioning ecosystems and establish coherent ecological networks, with more and better places for nature for the benefit of wildlife and people.

The strategy describes what is needed to halt biodiversity loss and has set out goals in relation to Biodiversity and Climate Change:

- The restoration of 15% of degraded ecosystems – as a contribution to climate change mitigation and adaptation; and,
- Overall improvement in status of our wildlife and prevention of further human induced extinctions of known threatened species.

Local

Uttlesford Local Plan Adopted January (2005) saved policies (2007)

14.21 The Uttlesford Local Plan Adopted January 2005 is the most recent Local plan.

14.22 The importance of climate change is echoed in the NPPF which requires Local Planning Authorities to adopt positive strategies towards dealing with climate change and sustainability. This is set out in Uttlesford Local Plan in a number of policies:

Policy GEN1 – Access

Development will only be permitted if it meets all of the following criteria:

- a) Access to the main road network must be capable of carrying the traffic generated by the development safely.*
- b) The traffic generated by the development must be capable of being accommodated on the surrounding transport network.*
- c) The design of the site must not compromise road safety and must take account of the needs of cyclists, pedestrians, public transport users, horse riders and people whose mobility is impaired.*
- d) It must be designed to meet the needs of people with disabilities if it is development to which the general public expect to have access.*
- e) The development encourages movement by means other than driving a car.*

Policy GEN2 – Design

Development will not be permitted unless its design meets all the following criteria and has regard to adopted Supplementary Design Guidance and Supplementary Planning Documents.

- a) It is compatible with the scale, form, layout, appearance and materials of surrounding buildings;*
- b) It safeguards important environmental features in its setting, enabling their retention and helping to reduce the visual impact of new buildings or structures where appropriate;*
- c) It provides an environment, which meets the reasonable needs of all potential users;*
- d) It helps to reduce the potential for crime;*
- e) It helps to minimise water and energy consumption;*
- f) It has regard to guidance on layout and design adopted as supplementary planning guidance to the development plan;*
- g) It helps to reduce waste production and encourages recycling and reuse;*
- h) It minimises the environmental impact on neighbouring properties by appropriate mitigating measures;*
- i) It would not have a materially adverse effect on the reasonable occupation and enjoyment of a residential or other sensitive property, as a result of loss of privacy, loss of daylight, overbearing impact or overshadowing.*

Policy GEN3 – Flood Protection

Within the functional floodplain, buildings will not be permitted unless there is an exceptional need. Developments that exceptionally need to be located there will be permitted, subject to the outcome of flood risk assessment. Where existing sites are to be redeveloped, all opportunities to restore the natural flood flow areas should be sought.

Within areas of flood risk, within the development limit, development will normally be permitted where the conclusions of a flood risk assessment demonstrate an adequate standard of flood protection and there is no increased risk of flooding elsewhere. Within areas of the floodplain beyond the settlement boundary, commercial industrial and new residential development will generally not be permitted. Other developments that exceptionally need to be located there will be permitted subject the outcome of a flood risk assessment.

Outside flood risk areas development must not increase the risk of flooding through surface water run-off. A flood risk assessment will be required to demonstrate this. Sustainable Drainage Systems should also be considered as an appropriate flood mitigation measure in the first instance.

For all areas where development will be exposed to or may lead to an increase in the risk of flooding applications will be accompanied by a full Flood Risk Assessment (FRA) which sets out the level of risk associated with the proposed development. The FRA will show that the proposed development can be provided with the appropriate minimum standard of protection throughout its lifetime and will demonstrate the effectiveness of flood mitigation measures proposed.

Policy GEN7 – Nature Conservation

Development that would have a harmful effect on wildlife or geological features will not be permitted unless the need for the development outweighs the importance of the feature to nature conservation. Where the site includes protected species or habitats suitable for protected species, a nature conservation survey will be required. Measures to mitigate and/or compensate for the potential impacts of development, secured by planning obligation or condition, will be required. The enhancement of biodiversity through the creation of appropriate new habitats will be sought.

Uttlesford Climate Change Strategy 2020-2024

- 14.23 Uttlesford Council declared a climate and ecological emergency in autumn 2019. From this a new strategy and action plan was developed. The Action Plan has measures to reduce carbon emissions, deliver sustainable development, provide sustainable transport infrastructure, improve air quality, protect biodiversity and habitats and promote and improve environmental stewardship. They will seize the green economy opportunities offered to the district and develop new green sector skills and jobs, improve health and adapt to the impacts of climate change with stronger, more resilient, communities.
- 14.24 The Council resolves:
1. *To declare a Climate and Ecological Emergency, acting now to prevent a climate and ecological catastrophe that will greatly impact our children, grandchildren and future generations*
 2. *To commit to achieving net-zero carbon status by 2030 and protecting and enhancing biodiversity by:*
 - *Delegating the Cabinet Member for Environment and Green Issues to establish an Energy and Climate Change Working Group of Cabinet.*
 - *Working collaboratively across the Council and engaging with individuals, community groups, businesses and other partners in the district, including young people who should have a voice to help shape our future.*

- *Lobbying Central Government to urgently provide funding and implement necessary policy changes.*
- *Producing a bold plan of action that is realistic, measurable and deliverable.*
- *Ensuring significant progress has been made to deliver the action plan by April 2023.*

Uttlesford Interim Climate Change Planning Policy

14.25

The Interim Climate Change Planning Policy Document was produced on a non-statutory basis to bridge the gap between the Council's adopted 2005 Local Plan and the new one. The main purpose of the document is to reiterate to developers that Uttlesford District Council is resolute about climate change mitigation and adaptation measures. The policies in this document relate to minimising Climate Change and achieving net zero by 2030, without harming the environment. The policies outlined in this document have been considered throughout this Chapter. Broadly, these policies comprise the following aspects related to climate change:

Interim Policy 1: net-zero carbon.

Interim Policy 2: site surroundings and heritage.

Interim Policy 3: consumption of water.

Interim Policy 4: flood risk.

Interim Policy 5: material decrease in air quality.

Interim Policy 6: natural environment.

Interim Policy 8: Interim Policy 8: extent density and the mix of uses.

Interim Policy 9: renewable energy infrastructure and community energy schemes for renewable energy.

Interim Policy 10: landform and the selected landscape network.

Interim Policy 11: future proofing at the layout level.

Interim Policy 12: green and intelligent design and green infrastructure.

Interim Policy 13: travel by sustainable transport modes.

Interim Policy 14: electric vehicle parking and charging standards as outlined below:

- *all new parking spaces should be adaptable for electric vehicle fast charging (7- 22 kW), including through local electricity grid reinforcements, substation design and ducting;*
- *all new homes with on-plot parking should be provided with at least one installed charging point; and*
- *at least 20% of parking spaces in new developments should be provided with installed fast charging points, increasing in accordance with the Road to Zero Strategy.*

Essex Green Infrastructure Strategy (Essex County Council, 2020)

14.26

At a County level, the Essex Climate Action Commission has been established. The Commission had its first meeting on the 12th May 2020. From this, the County Council produced the Essex Green Infrastructure Strategy. The objectives area:

- *protect existing green infrastructure, especially designated sites,*
- *improve existing green infrastructure so it is better functioning for people and wildlife,*

- *create more high-quality multi-functional green infrastructure, especially in areas of deficiency,*
- *improve the connectivity of green infrastructure for people and wildlife,*
- *increase use and inclusivity of green infrastructure across all user groups, social groups and abilities,*
- *provide green infrastructure facilities to promote health and wellbeing,*
- *working with partners to build and secure funding, effective governance and stewardship for new and existing green infrastructure to ensure their long-term sustainability.*

Net Zero: Making Essex Carbon Neutral

14.27 The Essex Climate Action Commission (ECAC) is an independent, voluntary and cross-party body, bringing together groups from the public and private sector. It was established in May 2020. The purpose of the commission is to provide expert advice and up-to-date recommendations to move Essex to net zero by 2050. The committee has recommendations for adaption and resilience measures structured around six core themes:

- Land Use and Green Infrastructure;
- Energy;
- The Built Environment;
- Transport;
- Waste; and
- Community Engagement.

SECTION 1: CLIMATE CHANGE MITIGATION

Introduction

14.28 This section considers the anticipated GHG emissions as a result of the development, the predominant impact as a contributor to future climate change, and the measures taken to mitigate these impacts during and post-construction.

14.29 It should be noted that the assessment of GHG emissions in this section is still an emerging science with no single accepted methodology for the assessment of climate change within EIA. Nonetheless, all relevant IEMA guidance reports have been followed where it is considered appropriate.

Assessment Methodology

14.30 Determining the significance of effect is complex as climate change is a consequence of numerous activities and developments across the globe, the vast majority of which are outside the control of the Applicant. In this context, the approach taken is to assess the baseline GHG emissions and the effect the development will have on these to demonstrate the potential effect of these GHG emissions on climate change in the context of national carbon budgets.

14.31 There is at present no single accepted methodology for the assessment of climate change within EIA. The assessment methodology is therefore based on professional judgement and existing sources of guidance.

Existing Baseline

- 14.32 Given that the current use on site is agricultural land, the potential sources and amount of GHG emissions was considered to be neutral and therefore the existing baseline is assessed as zero.

Construction and Operation

- 14.33 In the absence of detailed information of potential materials, construction phasing and transportation, a quantitative greenhouse gas emissions predictions as a result of the construction works of the development was not undertaken.
- 14.34 The assessment of the effects of the Proposed Development on climate has been undertaken qualitatively by considering the energy efficiency feasibility and the proposed reduction in carbon production undertaken by Green Heat Ltd. Where possible, assessing this in relation to wider sources of emissions. In addition, the provision of mitigation measures within the Proposed Development to minimise energy use have been considered within this assessment Study Area.

Study Area

- 14.35 Although GHG emissions and associated effects on climate change are considered as national and global issues, this section of the ES chapter is not restricted by geographical area but instead includes any increase or decrease in emissions as a result of the Scheme, wherever that may be.

Receptor Sensitivity

- 14.36 The terminology used within the methodology in this chapter to assess climate change mitigation is based upon the Climate Change Resilience and Adaptation Guidance IEMA guidance, which differs from the methodology stated in chapter 2 of the original ES.
- 14.37 The earth's atmosphere / climate is the receptor for the assessment of the effects on climate as a result of GHG emissions as per IEMA guidance. The receptor is considered to be sensitive to any increase in GHG emissions and therefore and is categorised as being of Very High Sensitivity.
- 14.38 Current emission levels are already having an effect on the climatic system and to avoid catastrophic climate change, the level of global warming must remain within a two-degree limit, which will be exceeded if global emission reductions are not achieved. This means that maintaining current emissions levels (assumed net zero), with no change as a result of the project, would still have a climatic effect.
- 14.39 Reductions in emissions as a result of a development are classified on the same scale and are beneficial or adverse. There is no widely accepted method for defining the magnitude of impacts in terms of development GHG emissions measured as carbon dioxide (CO₂), however, IEMA Guidance 2017 magnitude scales have been used within this assessment and are categorised in **Table 14.2A** below.

Table 14.2A Determining Magnitude of Impact for the Assessment of Effects on Climate

IMPACT	MAGNITUDE
An increase in GHG emissions and sources of emissions, contributing substantially to local and global GHG emissions	Moderate to Substantial Adverse
A small increase in GHG emissions and sources of emissions, contributing to local and global GHG emissions.	Slight Adverse

IMPACT	MAGNITUDE
No increase in local and global baseline emissions.	Negligible / None
A small reduction in GHG emissions and sources of emissions, contributing to the reduction in anticipated local and global GHG emissions	Slight Beneficial
A reduction in GHG emissions and sources of emissions, contributing to the reduction in anticipated local and global GHG emissions	Moderate to Substantial Beneficial

Effect Significance

- 14.40 When assessing the significance of effect in relation to climate change, both the susceptibility and resilience of the receptor to climate change as well as the value of the receptor must be considered.
- 14.41 On this basis, a high value receptor that has very little resilience to changes in climatic conditions should be considered more likely to be significantly affected than a high value receptor that is very resilient to changes in climatic conditions.
- 14.42 As established above, the climatic system is sensitive to any increase in GHG emissions, therefore the level of sensitivity does not vary, and the significance of the effect is applied only by assessing the impact of the magnitude of effect. The significance matrix to be applied has been set out in **Table 14.3A** below.
- 14.43 The effect can either be adverse or beneficial. A negligible effect is also possible if the magnitude of GHG emission change is neutral. As per 2017 IEMA Guidance, all effects that are Intermediate or greater should be defined as significant in EIA terms for the purpose of this assessment.

Table 14.3A Significance of effects matrix

		MAGNITUDE OF IMPACT				
		MODERATE TO SUBSTANTIAL ADVERSE	SLIGHT ADVERSE	NEGLIGIBLE/ NONE	SLIGHT BENEFICIAL	MODERATE TO SUBSTANTIAL BENEFICIAL
SENSITIVITY OF RECEPTOR	Very High	Major	Intermediate	Neutral	Intermediate	Major

Limitations of the Assessment

- 14.44 At this stage of the Proposed Development only indicative details of the proposed construction methods and materials and the design of the development are available, rendering only a high-level assessment available to be undertaken. As far as practical, data specific to the project was not available and other external sources of data were used. Where uncertainties were encountered and assumptions were made, these were disclosed.
- 14.45 The assessment is not detailed and therefore does not take into account complex issues related to direct and indirect emissions of GHGs.

14.46 The latest UK local authority and regional carbon dioxide emissions national statistics updated annually by the Department for Business, Energy and Industrial Strategy (BEIS) were estimated for year 2005 to 2019. Therefore, 2019 datasets represent the latest evidence of regional GHG emissions.

14.47 Despite the above, it is not expected that any of the above limitations, if addressed through significant extra assessment effort, would change the conclusion of the impact assessment.

Existing Baseline Conditions

14.48 The IEMA Guidance recommends that a new development which replaces an existing development should use existing GHG emissions as a baseline to determine whether the change is positive or negative.

14.49 As per IEMA Guidance (2017), the current baseline is based upon what is currently on site, whereby the Proposed Development does not go ahead. The Application Site has a gross area of 18.3ha and is used for agricultural purposes.

14.50 There are a number of mechanisms through which GHG emissions are released during agricultural activity, particularly in relation to the production of nitrous oxide from soil through microbial processes converting nitrogen in fertilisers and from agricultural activities such as ploughing. In relation to the Application Site, there is no reliable way of estimating current emissions, however, it is anticipated that emissions would be low in scale relative to those as a result of the Proposed Development. The current baseline condition is therefore assumed to be one with zero GHG emissions.

Local, Regional and National Baselines

Uttlesford District GHG Baseline

14.51 Estimates of current annual GHG emissions are updated annually by the BEIS. The datasets previously undertaken by BEIS for Uttlesford for the period 2005-2019 showed a decrease in emissions between 2005 and 2019 seen in **Table 14.4A**.

Table 14.4A: Local Authority CO₂ Emissions for Year 2005 and 2019 by Sector (ktCO₂)

	YEAR	INDUSTRY TOTAL	COMMERCIAL TOTAL	DOMESTIC TOTAL	TRANSPORT TOTAL	GRAND TOTAL
UTTLESFORD	2005	117.7	85.5	203.0	528.3	941.4
	2019	66.9	39.1	141.1	499.0	730.3

14.52 UK Local Authority CO₂ emission estimates 2019 (BEIS, 2021), show that the total emission for East of England have decreased since the baseline data from 2005, representing an average decrease in CO₂ emissions per capita by region, as shown on **Figure 14.1A** below. A map representation of the total emissions of carbon dioxide per capita by Local Authority are shown on **Figure 14.2A**.

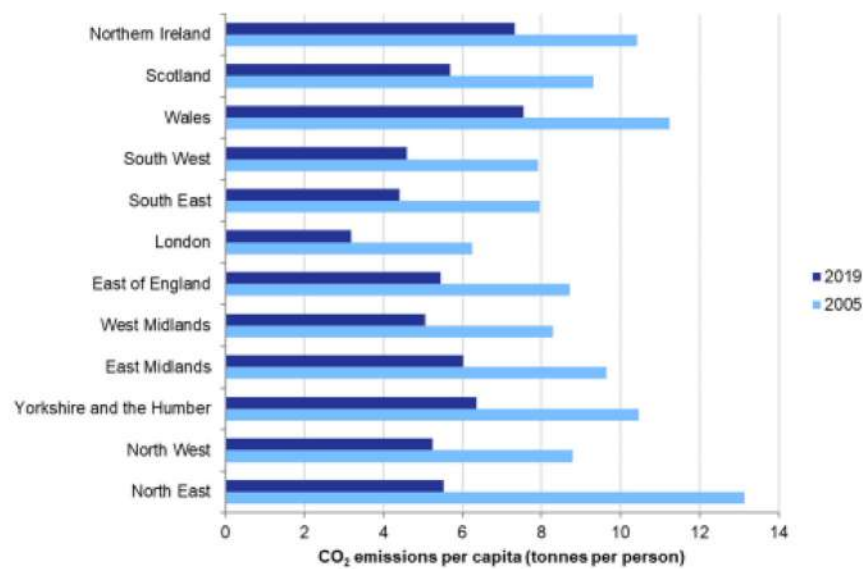


Figure 14.1A: End-user Carbon Dioxide Emissions per Capita by Region, 2005 and 2019

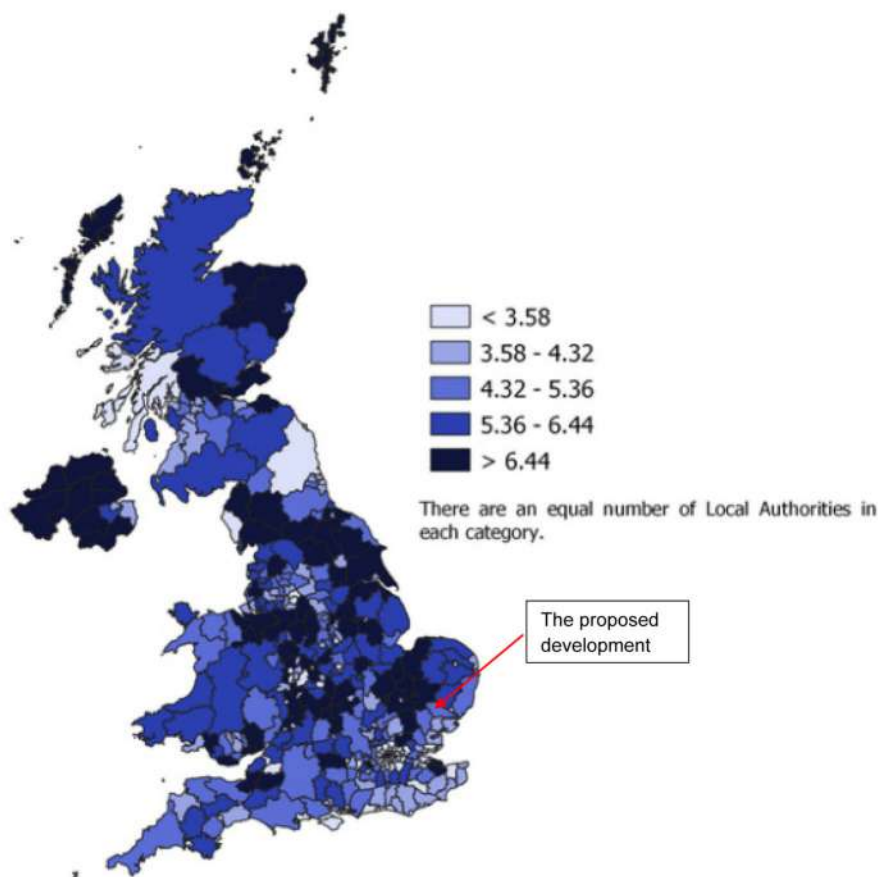


Figure 14.2A: Net Emissions of Carbon Dioxide per Capita by Local Authority (Tonnes CO₂ per Capita) in 2019

- 14.53 The CO₂ emissions estimates for years 2005 and 2019 (ktCO₂) per sector (Department for Business, Energy and Industrial Strategy, 2019) outline CO₂ emissions for Uttlesford. **Table 14.5A** identifies that all sectors have seen a decrease in overall CO₂ emissions, with Uttlesford representing approximately 10.7% of the overall Essex emissions in 2019.

Table 14.5A Uttlesford Emissions by Year 2005 and 2019 by Sector (ktCO₂)

TEST VALLEY	YEAR	INDUSTRY AND COMMERCIAL TOTAL	DOMESTIC TOTAL	TRANSPORT TOTAL	GRAND TOTAL	ESSEX GRAND TOTAL	UTTLESFORD PROPORTION OF ESSEX'S GRAND TOTAL
	2005	203.2	203.0	528.3	941.4	9,999.7	9.4%
	2019	106	141.1	499.0	730.3	6,834.2	10.7%
CHANGE IN EMISSIONS OVER TIME (BY SECTOR)		-47.8%	-30.3%	-5.5%	-22.4%		

National Baseline: UK

- 14.54 The UK compiles an annual inventory of its GHG emissions in order to monitor progress against domestic and international targets such as the carbon budgets and Kyoto Protocol respectively.
- 14.55 Graphical representations of CO₂ emissions and GHG emissions since 1990 are shown in **Figure 14.3A** below, these include the provisional emissions for 2020 published in March 2021 (BEIS, 2019).
- 14.56 Carbon dioxide emissions in the UK are provisionally estimated to have fallen by 10.7% in 2020 from 2019, to 326.1 million tonnes (Mt), and total greenhouse gas emissions by 8.9% to 414.1 million tonnes carbon dioxide equivalent (MtCO₂e). Total greenhouse gas emissions were 48.8% lower than they were in 1990.

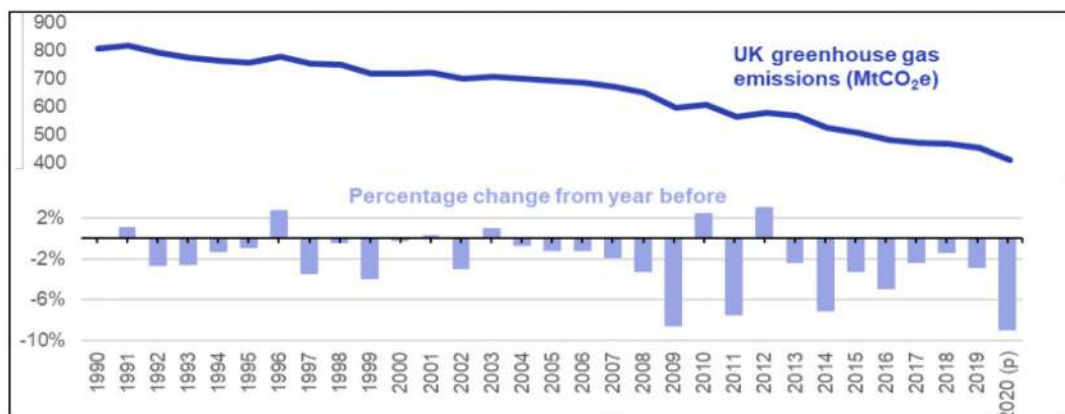


Figure 14.3A: Total UK Greenhouse Gas Emissions, 1990-2020 (MtCO₂e)

- 14.57 This large fall in 2020 is primarily due to the large reduction in the use of road transport during the nationwide lockdowns and the reduction in business activity. CO₂ emissions from transport fell 19.6% in 2020, accounting for over half of the overall fall from 2019, and in the business sector they fell by 8.7%. Conversely, CO₂ emissions from the residential sector increased by 1.8% as more people stayed at home. CO₂ emissions from the energy supply sector fell by 11.9% following lower demand during the pandemic and the continued reduction in fossil fuel use in power stations
- 14.58 Globally, the GHG emissions are estimated to have grown significantly since pre-industrial times due to human activities. Carbon dioxide is the most important anthropogenic GHG and in 2019 it accounted for 80% of the UK's GHG emissions.
- 14.59 The residential sector contributed to approximately 15% of UKs' GHG emissions in 2019 with the largest sector contributing 27% being transport, which includes emissions from road transport, railways, domestic aviation, shipping, fishing and aircraft support vehicles (BEIS, 2019).

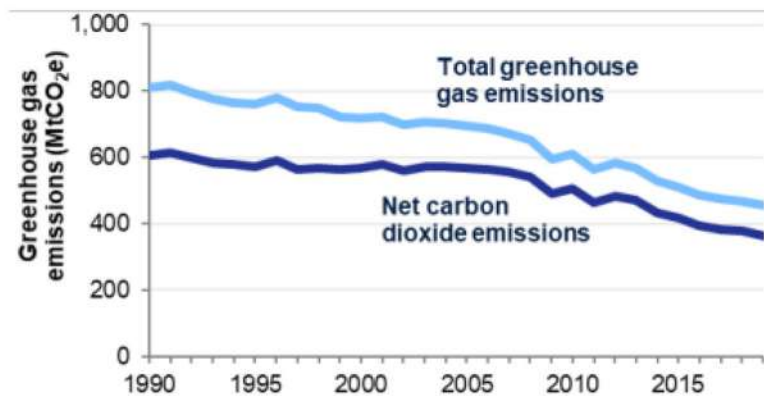


Figure 14.4A Total UK greenhouse gas emissions 1990-2019 (MtCO₂e)

Evolution of the Baseline Conditions without Development

- 14.60 The Department for Business, Energy and Industrial Strategy released Energy and Emissions Projections in 2017, most recently updated in 2019. This demonstrates GHG emissions from the following sources are projected to total the following in 2035:
- Business – 69 MtCO₂;
 - Industrial Processes – 10 MtCO₂;
 - Residential Uses – 77 MtCO₂; and,
 - Transport – 102 MtCO₂.
- 14.61 All sources are predicted to decrease by 2035, excluding the residential sector which is due to increase by 8 MtCO₂.

Embedded Mitigation

- 14.62 The new development is anticipated to incorporate energy design measures to reduce energy demand and therefore CO₂ emissions. Both passive and active energy measures are undertaken.

14.63 The mitigation proposed below is reflective of the design information available at this stage. If alternative construction materials or methodologies that may reduce or increase the emission impact are identified once the development progresses to construction works stages, it is assumed that these will be considered and used where practical.

14.64 Uttlesford Interim Climate Change Planning Policy has been considered throughout the mitigation measures included in the design of the Proposed Development.

Design and Operation

14.65 An Energy Efficiency Feasibility Assessment produced by Green Heat Ltd (see **Appendix 14.1A**) looked at the possible alternative sources of renewable energy on site (wind generation, ground source heat pumps, PV cells, Biomass heating, CHP, Solar Thermal Hot Water etc) and identified that Fabric First- enhancing the construction materials to save the carbon for life would be the most effective given the scale of development and physical constraints of the Site. The feasibility study indicates that with the proposed high efficiency heating and hot water systems and controls, enhanced fabric U-values of construction, proposed dwelling design in terms of enhancing heat gains through passive solar gains and 100% Low Energy Lighting, the development will achieve a 19.01% reduction in CO₂ emissions. Further reductions towards net zero carbon can be achieved through the provision of PV cells.

14.66 It is envisaged that the building envelope of new residential dwellings will be designed with the aim of selecting materials which are resilient to the impacts of climate change and which meet the standards of the most up to date **Building Regulation Part L**. This will be achieved through the implementation of the energy hierarchy:

- Be Lean (minimise energy use);
- Be Clean (provide energy efficiently); and,
- Be Green (use low and zero carbon energy technologies).

14.67 Given the outline nature of the development, limited measures can be embedded into the indicative masterplan to reduce overall GHG emissions associated with the development. Therefore, any measures associated with detail design measures are provided in the additional mitigation section. Should the Building Regulations be amended at the Reserved Matters stages, the commitment to achieve 19% reduction in CO₂ emissions is against current building regulations, which is reflective of the requirements of UDC's interim climate change policy. Some of the proposed measures are outlined below:

- **Waste** – During the development there will be a provision of waste recycling to divert waste from landfill.
- **Energy efficient lighting**; Each dwelling will be fitted with 100% energy efficient LED light fittings to reduce energy consumption. Where external lighting is provided, this will also include photocells to control for the presence of daylighting and/or PIR presence detection, where appropriate.
- **Water**; Conservation measures such as water butts and water metering technologies, including Low flush toilets, flow regulated spray taps and shower heads and A Rated Water efficient appliance – this would minimise water consumption to 110 litre per person per day;
- **Transport**; The Site is supported by good transport links with easy walking distance to the facilities proposed on site. To encourage walking and cycling, the Site landscaping and infrastructure was designed with sustainable transport considerations in mind, including segregated routes, dedicated cycle routes, pedestrian bridge and riverside paths. These

measures are discussed in greater detail in the Transport Assessment and Travel Plan supporting the planning application.

Mitigating Construction Effects

- 14.68 A CEMP will be prepared by the appointed contractor and which will implement Good construction practices and the likely measures will include:
- Materials will be selected with lower transport-related carbon emissions and therefore sourced locally, wherever practical;
 - Deliveries during peak hours will be avoided;
 - Regular vehicle maintenance;
 - When not required, lights and any other energy-consuming equipment will be switched off; and
 - Tools, equipment and construction plant used on-site will be well maintained and kept in a good working order.

Predicted Impacts

Construction Phase

- 14.69 It is recognised that GHG emissions will be generated during the construction phase from the following sources:
- Use of fuel in the transportation of people and materials around the Site and off-site;
 - Use of light and other power in the welfare facilities, construction compound, and in the use of machinery around the Site;
 - Use of quantities of other resource materials during the construction; and,
 - The removal, disturbance and disposal of embodied energy that is locked up within the existing materials present on the Site (e.g. soils and living vegetation etc.).
- 14.70 Construction is planned to start in 2023, subject to securing planning permission, with the first properties available later in 2024. The Proposed Development is anticipated to be completed approximately seven years following commencement.
- 14.71 A fully detailed and quantified assessment was not undertaken due to the professional opinion that relatively short-term temporary release of GHGs associated with construction, are expected to be minimal in terms of the contribution to climate change effects. Also, as at this stage of the Proposed Development only indicative details of the proposed construction methods and materials are available and no details on the construction materials are available, it is not possible to quantify the exact amount of GHG emissions.
- 14.72 When compared to the overall operational phase, the construction works are considered to be temporary in nature and therefore it is expected that construction of the Proposed Development will result in a **slight** adverse magnitude in respect to GHG emissions. Considering the scale and length of construction in comparison to the wider extent of emissions contributing to climate change, and given the sensitivity of the receptor it is considered that GHG emissions during construction will be **intermediate** adverse and **significant** in EIA terms.

Operational Phase Effects

- 14.73 Once the Proposed Development is complete and occupied, the majority of the GHG emissions will be associated with energy consumption, both fuel, electricity and transportation for commuting purposes. The emissions are unlikely to represent the same rate every year and are likely to change as technology progresses and the move towards renewable energy increase. An energy efficiency feasibility assessment was produced, which identifies that the development could achieve a 19% reduction on the dwelling (carbon dioxide) emission rate against the Target Emission Rate as defined in the 2013 Building Regulations in line with Uttlesford District Council's Interim Climate Change Planning Policy. In comparison to emission scenarios at different geographic scales, including regional, national and international scales, the emissions of the Proposed Development are considered to be low and can be reduced further in accordance with the most up to date building regulations and net zero standards. As the sensitivity of the receptor (i.e. the earth's atmosphere / climate) is very high and the impact of the GHG emissions is considered to be slight adverse, (resulting in a slight decrease in the baseline CO₂ emissions), the overall effect is considered to be **intermediate**, which is **significant** in EIA terms.

Additional Mitigation, Compensation and Enhancement Measures

Scheme Design

- 14.74 The Energy Efficiency Feasibility Assessment produced in line with the energy hierarchy, has determined that the development could achieve a 19% reduction on the dwelling (carbon dioxide) emission rate against the Target Emission Rate as defined in the 2013 Building Regulations in line with Uttlesford District Council's Interim Climate Change Planning Policy.
- 14.75 Heat Pumps, Photo Voltaic Panels, Solar Thermal, Wastewater Heat Recovery, Flue Gas Heat Recovery were all modelled and considered for this project as options towards achieving the carbon reduction considerations for planning. The following technologies have been discounted as part of our feasibility study due to practical constraints for the Site and economic viability: Wind Generation, Biomass, District/Community Heating & Combined Heat and Power. To achieve net zero, the feasibility study identified the requirement of additional 811 kWp PV Panels.
- 14.76 The exact measures that will be used in the Proposed Development will be provided during Reserved Matters of the scheme during which the exact percentage of carbon reductions will be calculated. Where practical, 'be seen' energy hierarchy measures will also be included, promoting smart metering and offering post occupancy evaluations 12 months after use.
- 14.77 Some of the options that will be considered within the energy reduction strategies as listed above are outlined below.
- **Natural Daylighting:** the proportions and distribution of glazing are expected to ensure good levels of daylight, helping to reduce electricity consumption through artificial lighting.
 - **Natural Ventilation:** the scheme will be designed and built to minimise the risk of summer overheating without the use of comfort cooling via natural ventilation, solar controlled glazing and effective external shading.
 - **Energy-efficient white goods;** Where provided, white goods and kitchen equipment are to be energy efficient:
 - Minimum of A+-rating for fridges and freezers or fridge-freezers;
 - Minimum of A rating for washing machines and dishwashers; and,

- Minimum of A rating for washer-dryers or tumble dryers.
- **Energy management systems**, such as smart meters will be installed in all dwellings to enable residents to monitor their energy usage and provide an aid to reduce energy consumption;
- Cool, light coloured building materials will be considered, where appropriate, to optimise the reflection of light and minimise heat absorption while avoiding glare and addressing potential urban heat island effects.
- **Rainwater harvesting and greywater recycling** of non-potable water.
- **Sustainable transport measures**, including:
 - EV Changing Points: Provision of an electric car charging supply point to the garage or parking space adjoining each private dwelling
- **Insulation**; Dwellings will incorporate insulation measures incorporating draught proof and doors, double glazed with low -E glass, insulated hot water tanks and pipes.

Construction Phase

- 14.78 It is recommended that a local construction contractor with good sustainability credentials is chosen for the works and that construction materials are sourced locally wherever practical. Any other measures will be controlled through good construction practices and / or a CEMP.

Residual Effects

- 14.79 The residual effects are unlikely to reduce with the additional mitigation in place as the exact percentage reduction in GHG cannot be calculated at this stage and therefore it cannot be assumed that the development will be carbon neutral at either construction or operation. Therefore, there is an **intermediate residual effect** which is **significant** in EIA terms. Nonetheless, as the development shows potential for net zero carbon with the inclusion of additional PV panels, it can be assumed that the potential effect may be reduced to a non-significant level, as the detailed design is progressed.

Cumulative Impacts

- 14.80 Cumulative effects are considered relevant in climate change terms with regard to GHG emissions and impacts of changes in climate on the Proposed Development in consideration of the additional Proposed Developments in the area.
- 14.81 However, because climate change is a global issue, all developments taking place across the world results in net increases in GHG emissions and can be considered to operate cumulatively. Therefore, all developments identified by the EIA co-ordinator the ES are considered as part of this assessment. Based on the above, the cumulative impacts are assumed to be the same as those already identified above and would result in a **slight** effect which is considered to be **significant**.
- 14.82 Construction of all the listed cumulative schemes would all produce GHG emissions, contributing to climate change. However, it is reasonable to conclude that construction of the project, in accumulation with all the other developments proposed in the locality, would in combination with the other projects, give rise to significant GHG emissions at those scales and therefore the cumulative effect can be assumed to be the same as that for the Proposed Development, **slight** and **significant** in EIA terms.

Operation

- 14.83 During operation of all the listed cumulative schemes, GHG emissions would inevitably be produced by the users of the development. In line with the cumulative construction impacts, it is reasonable to conclude that the project, in accumulation with all the other developments proposed in the locality, region, nationally and internationally could, in combination with the other projects, give rise to significant GHG emissions. This is an unfortunate consequence of human activity and will continue to be the case with the majority of development until the life cycle is carbon neutral. However during operation the proposed dwellings will achieve in excess of 19% Reduction in CO₂ emissions. Due to this, there would be an **intermediate** effect which is considered to be **slight adverse** and **significant** in EIA terms.

Monitoring

- 14.84 To monitor the overall GHG emissions following the completion of the development, installation of smart meters / metering strategy should be considered. This will aim to minimise peak energy demand and promoting short-term energy storage. The metering strategy must be designed to be capable of monitoring and reporting on their actual operational energy performance in aim to bridge the 'performance gap' through understanding discrepancies between design theory and in-use operation.

Summary of Impacts

- 14.85 The potential impacts during both, the construction and operational phases are considered to be **intermediate adverse** and are **significant** in EIA terms and are listed in the summary of impacts table.

SECTION 2: CLIMATE CHANGE ADAPTATION

Introduction

- 14.86 This section considers the potential effects on the development as a result of climatic changes as identified for the local and regional areas and outlines potential measures taken to mitigate these impacts during and post-construction to ensure resilience to the identified changes.
- 14.87 It should be noted that the assessment in this section is still an emerging science with no single accepted methodology for the assessment of climate change within EIA. Nonetheless, all relevant IEMA guidance reports have been followed where it is considered appropriate.

Assessment Methodology

- 14.88 The assessment for the vulnerability of the development to climate change considers the effect of predicted changes in climate change on the development during the construction period and during operation of the development, up to the 2080s, as per the availability of UKCP18 data. In addition, the in-combination effects of climate change on the environmental receptors will be considered.

Receptor Sensitivity

- 14.89 The terminology used within the methodology in this chapter to assess climate change adaptation is based upon the Climate Change Resilience and Adaptation Guidance IEMA guidance, which differs from the methodology stated in chapter 2 of the original ES.

- 14.90 Individual receptor sensitivity is assessed based on their vulnerability to the future climatic changes. In the case of the Proposed Development, the most sensitive receptors are considered to be those whereby any effect may lead to a risk or injury to humans or that may comprise safety critical infrastructure.
- 14.91 The sensitivity of the potential receptors was based on the updated IEMA guidance on Climate Change Resilience and Adaptation (2020), and is outlined in **Table 14.6A** below

Table 14.6A Determining Sensitivity of Receptor for the Assessment of Effects on Climate

IMPACT	SENSITIVITY
Receptor particularly vulnerable to the climate change effects and potential impacts	High vulnerability
Receptor is sensitive to the climate effect and potential effects and mitigation will be provided	Moderate vulnerability
Receptor has a low sensitivity to potential climate effects	Low vulnerability

Effect Magnitude

- 14.92 The effects of climate change can be either positive or negative.
- 14.93 There is no widely accepted methodology for defining the magnitude of impacts in terms of the vulnerability of the development to changes in climate, however, these are usually assessed against UKCP projections, in this case UKCP18. UK Climate Change Risk Assessment produced in 2017 is the main report used for assessing risks of climate change and has a statutory obligation to consider risks to year 2100. The report uses an urgency category to assess each of the 56 individual climate risks and opportunities. These are: watching brief sustain current action; research priority; and more action needed varying; from less to more urgent scale. This methodology was incorporated in this assessment and was used to assess the vulnerability to climate change in respect to the Proposed Development. The used assessment is therefore outlined in **Table 14.7A** below.

Table 14.7A: Determining Magnitude of Impact for the Assessment of the Vulnerability of the Development to Climate Change

IMPACT	MAGNITUDE
Loss of receptor and/or considerable permanent damage/alteration to the characteristics, features or elements of the receptor; substantial permanent damage/alteration to key characteristics, features or elements.	Moderate to Substantial Adverse
Some measurable damage/alteration to key characteristics, features or elements of the receptor, primarily caused by a seasonal effect	Slight Adverse
Minor loss or damage/alteration to the characteristics, features or elements of the receptor.	Negligible / None
Some measurable benefits to the characteristics, features or elements of the receptor.	Slight Beneficial

Effect Significance

- 14.94 When assessing the significance of effect in relation to climate change, both the susceptibility and resilience of the receptor to climate change as well as the value of the receptor must be considered.
- 14.95 On this basis, a high value receptor that has very little resilience to changes in climatic conditions should be considered more likely to be significantly affected than a high value receptor that is very resilient to changes in climatic conditions.
- 14.96 As per updated IEMA Guidance (2019) all effects that are Intermediate or greater should be defined as significant in EIA terms for the purpose of this assessment. Additionally, if the uncertainty about how the receptor will adapt to a changing climate is high, then it is recommended that a conservative impact of significance is adopted within the evaluation.

Extent of the Study Area

- 14.97 The study area for the climate change adaptation assessment comprises the Site and its surrounding area. The full extent of the Site is covered in Chapter 3 of the original ES.

Limitations of the Assessment

- 14.98 Information on the climate baseline and future projections are based on freely available information from third parties, including the historical meteorological variables recorded by the Met Office and the UKCP18 developed by the Met Office. In addition, the assessment has been informed by a selected range of existing climate change research and literature available at the time of writing this assessment.
- 14.99 Climate projections are not predictions or forecasts but simulations of potential scenarios of future climate, under a range of hypothetical emissions scenarios and assumptions. Therefore, the results from running the climate models cannot be treated as exact or factual, but projection options. They represent internally consistent representations of how the climate may evolve in response to a range of potential forcing scenarios, and their reliability varies between climate variables. Tetra Tech has not independently verified the climate projections and does not accept responsibility or liability for any inaccuracies or shortcomings in this information.
- 14.100 Generally global projections are more certain than regional, and temperature projections are more certain than those for precipitation. Further, the degree of uncertainty associated with all climate change projections increases for projections further into the future.
- 14.101 The recommended approach in using emissions scenarios in the UK is Representative Concentration Pathway (RCP) 8.5, which represents the highest emissions scenario and consequently the worst-case scenario. Additionally, UKCP18 projections give a range of possible climate change outcomes and their relative likelihoods, which typically give climate information that is considered the unlikely, likely or very likely (ranging across the 10th to 90th percentiles). As per updated IEMA Guidance (2019), the recommended likelihood is 50th percentile of the RCP8.5 climate scenario. This means that the overall effect may not always represent the potential significance on a specific receptor and therefore represents an uncertainty of the overall effect.
- 14.102 Accordingly, any further research, analysis or decision-making should take account of the nature of the data sources and climate projections and should consider the range of literature, additional observational data, evidence and research available, and any recent developments in these.

- 14.103 It is not expected that any of the above limitations, if addressed at significant extra assessment effort, would change the conclusion of the impact assessment.

Existing Baseline Conditions

- 14.104 As effects on climate and changes in weather patterns are scientific predictions and form part of a future baseline, the existing baseline for the Proposed Development identifies historic climate changes to present day, specifically since the post-industrial year of 1991 to present day, for the Proposed Development and surrounding area.

Historic Climate Change Data for Essex, UK

- 14.105 Royal Meteorological Society provides a series of annual 'State of the UK Climate' reports which provide a summary of the UK weather and climate per calendar year, alongside the historical context for a number of climate variables. The most recent report was published in 2021, which summarises the data for 2020 updating the data from the 2019 report and the latest decade (2011 to 2020) and compares these datasets 1991–2020 and 1981–2010 averages. The report identifies the following historic and present changes referred to climate and weather in the UK as a whole:
- Year 2020 was third warmest, fifth wettest and eight sunniest on record for the UK. No other year has fallen in the top-10 for all three variables for the UK.
 - The most recent decade (2011–2020) has been on average 0.5°C warmer than the 1981–2010 average and 1.1°C warmer than 1961–1990.
 - The Central England Temperature series provides evidence that the 21st century so far has overall been warmer than the previous three centuries.
 - The most recent decade (2011–2020) has had 16% fewer days of air frost and 14% fewer days of ground frost compared to the 1981–2010 average, and 25%/20% fewer compared to 1961–1990.
 - 2020 was the UK's fifth wettest year in a series from 1862, with 116% of the 1981–2010 average and 122% of the 1961–1990 average rainfall.
 - Mean sea level around the UK has risen by approximately 1.5mm·year⁻¹ on average from the start of the 20th century.

Evolution of the Baseline Conditions without Development

- 14.106 UKCP18 uses scenarios for future GHG called the RCPs which cover a more up-to-date range of assumptions around future population and economic development.
- 14.107 Each pathway drives a different range of simulated global mean temperature increases over the 21st century. The four RCPs provided within the model, capture a range of potential alternative futures, spanning a range of projected mean temperature increases based on the rise in GHG. These are outlined and explained in **Table 14.8A** below.

Table 14.8A: Baseline Climate Data

RCP	INCREASE IN GLOBAL MEAN SURFACE TEMPERATURE (° C) BY 2081-2100	RANGE OF INCREASE IN GLOBAL SURFACE TEMPERATURE (° C) BY 2081-2100
RCP2.6	1.6	0.9-2.3
RCP4.5	2.4	1.7-3.2
RCP6.0	2.8	2.0-3.7
RCP8.5	4.3	3.2-5.4

- 14.108 RCP2.6 represent a future in which UK aims for and is able to implement sizeable reduction in emissions of GHG. Following this scenario, UK has a chance of limiting average warming to near 2 C above pre-industrial levels, which is consistent with the existing UK's targets.
- 14.109 UKCP18 projections for Uttlesford local area identified the following changes in respect to climate:
- An increase in the number of very hot days;
 - A decrease in the number of very cold days;
 - An increased risk of drought;
 - An increase in extreme sea level flooding events;
 - An increase in the number extreme weather events; and,
 - A longer growing season.
- 14.110 Climate Change predictions suggest the frequency and severity of extreme rainfall events is very likely to increase, associated with generally wetter winters and increased storminess triggered by higher temperatures.
- 14.111 Uttlesford District Council declared a climate emergency in July 2019. From this a pledge was made to work towards being net zero by 2030. Following this declaration, the Uttlesford Climate Crisis Strategy (2021 – 2030) was released. In Uttlesford it has been predicted weather will become more variable, summers will become hotter and dryer which will create in draught conditions, with implications on growing crops and water supplies. The typical autumn will become milder and wetter with increased frequency and intensity of extreme precipitation events.

Regional and National Baseline

- 14.112 The Met Office contains regional climate information for Uttlesford is located within the region of Eastern England. The table below presents the main climatic trends (MetOffice, 2016).

Table 14.9A: Historic Climate Baseline for Eastern England

CLIMATIC CONDITIONS	CLIMATIC OBSERVATIONS
Temperature	Mean annual temperatures vary from about 1-10.5 °C to about 9.5 °C.
Rainfall	Annual rainfall in Eastern England averages at over 700 mm per year and includes some of the driest areas of the country.

CLIMATIC CONDITIONS	CLIMATIC OBSERVATIONS
Wind	Eastern England is one of the more sheltered parts of the UK. There is a variation in monthly mean speeds.
Sunshine	Average annual sunshine totals are approximately 1600 hours.
Air Frost	The average number of days with air frost varies from less than 30 to 50 days.

14.113 **Figures 14.5A and 14.6A** show the predicted changes in temperatures and precipitation respectively for the UK region when global warming reaches 2°C above the pre-industrial levels - 1991. The figures illustrated below show:

- 14.114 Temperature:
- All areas of the UK are projected to experience warming;
 - Warming is greater in the summer than the winter;
 - Future rise depends on the amount of greenhouse gases the world emits;
 - The lowest scenario is compatible with aims to limit global warming since pre-industrial levels to below 2°C; and
 - The highest scenario will likely require significant further adaptation.

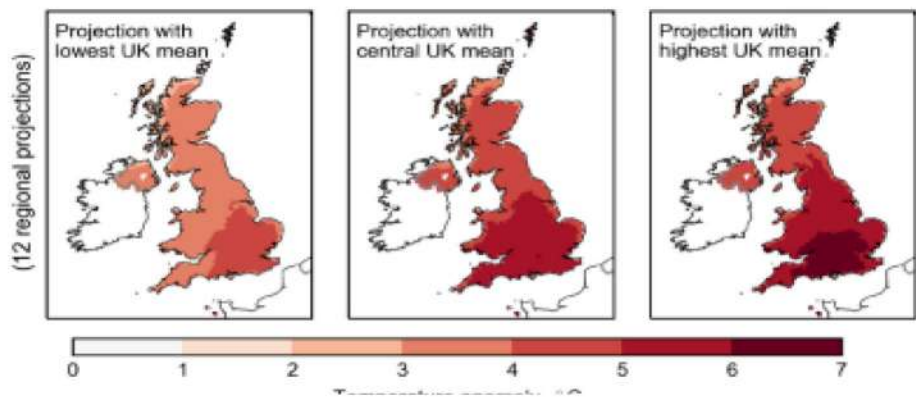


Figure 14.5A Change in mean temperatures reached (%)

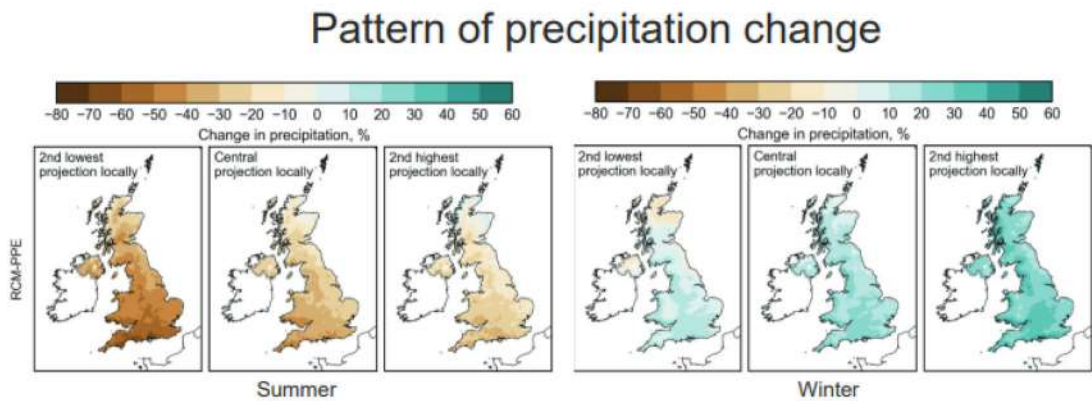


Figure 14.6A Change in Precipitation Rate (%)

- 14.115 Precipitation:
- Winter precipitation is expected to increase significantly;
 - Summer rainfall is expected to decrease significantly, however;
 - When it rains in summer there may be more intense storm.
- 14.116 The figures illustrated below show that the warming is expected to be greatest in the southern UK but the difference between southern and northern UK warming may not be particularly large. UKCP18 also projects a trend toward a greater chance of more rainfall in the winter but less rainfall in the summer. Nonetheless, for both temperature and rainfall the changes are considered to be much larger if GHG emissions assumed to continue to increase.
- 14.117 Under the high emissions scenario for the 2080s, estimated changes in climatic conditions are outlined in **Table 14.10A** below.

Table 14.10A: Future Climate Projections for the 2080s

CLIMATIC CONDITIONS	CLIMATE OBSERVATIONS
Temperature	The average summer temperature is estimated to increase by 4.5°C under the central estimate, which represents 'as likely as not' probability of change (50th percentile), and average winter temperature is estimated to increase by 3.7°C (50th percentile).
Rainfall	The average summer rainfall rate is estimated to decrease by 27%, whereas the average winter rainfall rate is estimated to increase by 26% (in the 50 th percentile or central estimate for both).
Wind	Climate projections for wind are more uncertain than those for temperature and precipitation, due to inherent difficulty in modelling future wind conditions. However, overall an increase in extreme weather including wind is projected (Committee on Climate Change, 2017).

Embedded Mitigation within the Submitted Design

Design

- 14.118 The Flood Risk Assessment takes into account an allowance for climate change in accordance with Environment Agency guidance. The surface water drainage strategy will be developed in accordance with the requirements of the NPPF and will be designed to be able to accommodate all storm events up to and including the 1 in 100-year event (plus 40% climate change) event.
- 14.119 Demand for freshwater can be mitigated by design with efficient use of potable water and rainwater harvesting and greywater recycling of non-potable water.
- 14.120 Surface water runoff generated by the proposal will be stored on site using attenuation basins and SuDS corridors. There are several basins proposed to be located throughout the Site for Sustainable Drainage Systems (SuDS). The indicative locations of the SuDS have been informed by the Flood Risk Assessment and Drainage Strategy found in Chapter 9 of the original ES.

- 14.121 The provision of SuDS is a key aspect for which the development will adopt measures to reduce surface water discharge through the use of SuDS, such as attenuation ponds. The SuDS provide opportunities for ecological enhancement in the landscape consisting of shallow vegetated depressions that temporarily hold water after heavy rainfall. The sizes and locations of the attenuation basins on site are determined by the amount of non-permeable development delivered across the Site. The basins will provide naturalistic green/blue open spaces that are multi-functional in nature, designed in such a way as to provide attenuation capability and provide opportunities for visual enhancement.
- 14.122 As the scheme emerges, it is envisaged that the building envelope of new residential dwellings will be designed with the aim of selecting materials which are resilient to the impacts of climate change, while respecting the local character of the area, minimising replacement and maintenance intervals and also reducing energy consumption through enhanced air tightness and thermal performance. In summary, the scheme will consider the following:
- Cool, light coloured building materials will be considered, where appropriate, to optimise the reflection of light and minimise heat absorption while avoiding glare and addressing potential urban heat island effects. Example materials include the use of lighter coloured bricks / roofing tiles and stone for the new dwellings, as well as concrete and stone hard landscaping materials etc. In addition, the specification of other materials, finishes and fastenings will be informed based on their suitability to cope with potential climate change impacts, such as increased temperatures, wind velocities and rainfall.
 - The new development will seek to incorporate water efficient sanitaryware within all residential and commercial premises, along with water metering in order to conserve potable water resources. Water resource management practices to reduce water demand for the development through the use of efficient fittings processes such as leak detection.
 - Green infrastructure throughout the Proposed Development is proposed in a northwest to south east direction, linking to public green space in the north and adding surface attenuation basins to the east. Opportunities will be explored to optimise the potential of these features to provide evaporative cooling effects and shading across the development Site, providing natural cooling during hotter summer months. A parkland area will be placed on higher ground to the north east of the Site. 55.15% of the Site will be used as Public Open Space, with the inclusion of High Land Park to the southeast of the Proposed Development. This will enhance biodiversity and habitat creation.

Construction

- 14.123 The CEMP will contain measures to ensure the construction site is able to adapt to the predicted changes in climate over the anticipated construction period.

Evaluation of Predicted Impacts

- 14.124 This section sets out the assessment of effects related to effects on climatic changes during the construction and operational phases of the Proposed Development.

Construction Phase Effects

- 14.125 Based on the current climate forecasts updated to the UKCP18 projections by the met Office, there is a projected change in:
- Precipitation; and,
 - Temperatures.

- 14.126 Following a review of the anticipated future climate within the London and southern UK areas and the relevant guidance, the following climate change risks and opportunities and associated receptors have been identified that are specific to the project.

Table 14.11A: Climate Change Risks and Receptors

CLIMATE CHANGE IMPACT	RISK	OPPORTUNITY	RECEPTOR
Increase in winter mean temperatures	Risk to species and habitats from changing climate	Opportunity for colonisation of new species	Habitats and species
		Opportunity for reduced energy use associated with heating	Building occupants – residential/ industrial/commercial
Increased summer mean and daily maximum temperature	Risk to species and habitats from changing climate	Opportunity for colonisation of new species	Habitats and species
	Increase in energy demand associated with cooling	-	Building occupants – residential/ industrial/commercial
	Risk of overheating affecting health and wellbeing	-	Building occupants – residential/ industrial/commercial
Decrease in summer rainfall	Risk to species and habitats from changing climate	-	Habitats and species
	Risk to fresh water supplies	-	Habitats and species Human receptors
	Risk to building and infrastructure foundations from ground movement	-	Building Infrastructure
Increase in winter rainfall	Risk of increase of flooding	-	Habitats and species Building Infrastructure Human receptors
	Increased risk for coastal flooding and erosion – effects associated primarily with sea level rise	-	Habitats and species Building Infrastructure Human receptors

- 14.127 The overall length of the construction phase will be seven years. When compared to the timescales of future climatic changes it is unlikely that significant changes may occur during the construction works of the Proposed Development. The construction works are considered to be of moderate sensitivity to climatic changes with the potential for negligible losses or damages if planned effectively. The overall effect on the construction works is, therefore, considered to be **negligible** and **not significant**.

Operational Phase Effects

Precipitation

Increase

- 14.128 Climate change is likely to result in increased extreme weather events and storm surges, as a result of increased precipitation and rainfall. Based on the updated UKCP18 climate forecasts, beyond 2040 when the Proposed Site will be operational these assumptions are projected to increase.

- 14.129 This increase in precipitation during winter will increase the risk of flooding from overflowing storm water sewers, particularly during heavy rainfall events which could cause flash flooding. Short, intense rainfall events on the other hand, can lead to pluvial or surface flooding as surface run-off inundates small catchments and the urban landscape.

Reduction

- 14.130 The reduction in precipitation during summer, with increased risk of drought and heatwaves, will heighten pressure on water and threaten the UK's water security and supply.

Temperatures

Increases

- 14.131 Extreme heat can have a range of impacts. Brief hot spells can lead to impacts on human health, due to higher night-time temperatures.
- 14.132 More prolonged heat can result in strong demands on water resources, cause pipe movement and breakages due to soil shrinkage and create unfavourable conditions for wildlife by damaging habitats.

Decreases

- 14.133 The impacts from extreme cold include a risk to health, particularly for vulnerable individuals, disruption to utility supplies from ice build-up on electricity cables and freezing of water pipes and disruption to road, rail and air transport.

Outcomes

- 14.134 Taking the above into consideration, during the operational phase, the development is likely to be at risk from the following:
- Increased precipitation resulting in flooding leading to deterioration of surfaces;
 - Increased precipitation would lead to increased erosion of areas of planting;
 - Increases in temperature have the potential to result in an increased risk of surface failure;
 - Increases in temperature may result in increased heat within the proposed buildings;
 - Increases in temperature, precipitation and extreme weather events could impact on the physical structure and materials of the buildings; and,

- Increased precipitation and higher temperatures affecting the growing of planting within the areas of landscaping and open space, requiring an increase in frequency and type of maintenance.

- 14.135 Considering the embedded mitigation within the Proposed Development, overall, the vulnerability to climate change would result in a slight magnitude of effect on the Proposed Development during its operational lifespan. Although the uncertainty surrounding the effects and timescales of effects of climate change should be kept in consideration.
- 14.136 The effect is therefore considered to be **minor**, which would be a **not significant effect**. The effect would be adverse, permanent, long-term, irreversible. It would be both direct (e.g. due to flooding of areas of the development), and indirect (e.g. due to increased temperatures and rainfall altering the growing patterns and lengths of vegetation, requiring increased maintenance of open space).

Additional Mitigation, Compensation and Enhancement Measures

Construction Phase

- 14.137 There is no need for specific adaptation measures to reduce the risk from climatic effects. However, care must be taken during construction to be aware of local forecast and allow flexibility in the approach to construction work as appropriate at the time.
- 14.138 It is anticipated that the choice of building material and types of planting within development will be considered for their vulnerability and their ability to adapt to the changing climate.

Operational Phase

- 14.139 The development will be designed and built-in line with the current Buildings Regulations or if, required, the relevant future standards.

Residual Effects

- 14.140 Climatic changes are not expected to impact on construction or operation of the Proposed Development and would range from negligible to minor adverse and therefore **not significant**.

Monitoring

- 14.141 This assessment undertaken and presented as part of the ES Addendum is reflective of the design information available at this stage. Additional detail in the design and specification of the Proposed Development will become available as the project progresses. For example, alternative construction materials or methodologies that may improve the resilience of the development may be identified once the development progresses to construction works stages. At this stage, a competent consultant will be appointed by the client to update the relevant assessments.
- 14.142 Throughout the key stages of the delivery programme any potential changes to the climate projections will be reviewed.

Summary of Impacts

- 14.143 No significant residual effects during both, the construction and operational phases were identified. The identified non-significant effects are listed in the summary of impacts table (**Table 14.12A**).

Table 14.12A: Summary of Impacts: *Climate Change*

DESCRIPTION OF IMPACT	RECEPTOR SENSITIVITY	MAGNITUDE	MITIGATION				IMPACT AFTER MITIGATION (RESIDUAL)				
			ADVERSE/BENEFICIAL	REVERSIBLE/IRREVERSIBLE	SHORT-TERM/LONG TERM	SIGNIFICANCE	ADVERSE/BENEFICIAL	REVERSIBLE/IRREVERSIBLE	SHORT-TERM/LONG TERM	SIGNIFICANCE	
Climate Change Mitigation											
Construction Phase: GHG emissions produced during the construction of the proposed development.	Very High	Int	Adv	Irrev	ST	Sig	Buildings will meet the standards of the most up to date Building Regulation Part L.	Adv	Irrev	ST	Sig
Operation phase: GHG emissions produced once the Proposed Development is complete and occupied.	Very High	Int	Adv	Irrev	LT	Sig	The scheme will be designed and built in current or future Buildings Regulations.	Ben	Irrev	LT	Sig
Vulnerability to Climate Change											
Construction Phase: Potential effects on the construction works derived from climatic changes	Mod	Slight	Adv	Irrev	ST	Neg, Not Sig	CEMP	Neg	Irrev	ST	Not sig

DESCRIPTION OF IMPACT	RECEPTOR SENSITIVITY	MAGNITUDE	MITIGATION				IMPACT AFTER MITIGATION (RESIDUAL)			
			ADVERSE/BENEFICIAL	REVERSIBLE/IRREVERSIBLE	SHORT-TERM/LONG TERM	SIGNIFICANCE	ADVERSE/BENEFICIAL	REVERSIBLE/IRREVERSIBLE	SHORT-TERM/LONG TERM	SIGNIFICANCE
Operation: Potential effects on the future residents and users of the non-residential uses during the operation of the development	High	Slight	Adv	Irrev	LT	Min, Not Sig	Neg	Irrev	LT	Not sig
			The scheme will be designed and built in current or future Buildings Regulations.							

Key:

Int: Intermediate Adv: Adverse Min: Minor Sig: Significant LT: Long Term
 Neg: Negligible Mod: Moderate Ben: Beneficial Irrev: Irreversible ST: Short Term

Major Accidents and Disasters

15

15.0 Major Accidents and Disasters

Introduction

- 15.1 This chapter reports the outcome of the assessment of the potential vulnerability of the Proposed Development to the risk of major accident(s) and/or disaster(s) as required by the EIA Regulations 2017. It has been prepared by WSP UK Limited to identify the likely significant environmental effects resulting from the vulnerability of the Proposed Development to the risk of major accident(s) and/or disaster(s).
- 15.2 This chapter describes the assessment methodology and the baseline conditions relevant to the assessment. Where appropriate, this chapter includes the further mitigation measures required to prevent, reduce or offset any significant adverse effects, the preparedness for and proposed response to emergencies, and the expected residual effects after these measures have been employed.
- 15.3 This chapter is intended to be read as part of the wider ES, with particular reference to Chapter 7: Air Quality, Chapter 8: Ecology, Chapter 9: Flood Risk and Drainage, Chapter 13: Transport and Chapter 14: Climate Change.
- 15.4 Based on professional judgement, major accidents or disasters are events or situations that have the potential to affect the Proposed Development causing immediate or delayed serious damage to one or more of the following: human health, welfare, and the environment. The assessment considers the risks of major accidents and disasters (MA&D) during construction and operation of the Proposed Development caused by natural hazards or manmade hazards (including operational failure).
- 15.5 The starting list of potential MA&D event categories and types to which the Proposed Development may be at risk of vulnerability during construction and operational phases are listed in **Table 15.1A**.

Table 15.1A: MA&D Event Categories and Types

CATEGORY	TYPE
Natural	Geophysical
	Hydrological
	Climatological and meteorological
	Space
	Biological
Technological or manmade hazards	Societal
	Industrial and urban accidents
	Transport accidents
	Pollution accidents
	Utility failures
	Malicious attacks
	Engineering accidents and failures

- 15.6 This chapter should be read in conjunction with technical sections (Chapters 6 to 15) to provide a broader environmental context on the risks associated with these MA&D event types. These chapters also outline the proposed measures to prevent or mitigate significant effects.

- 15.7 The definition of key terms used in this chapter are given in **Table 15.2A**. These definitions have been developed by reference to the definitions used in EU and UK legislation and guidance relevant to major accidents and/or disasters (European Commission, 2012, International Federation of Red Cross and Red Crescent Societies, 2021, Department of Environment, Food and Rural Affairs, 2011, HM Government, 2015, HM Government, 2009, Health and Safety Executive, 2015, Control of Major Accident Hazards (COMAH) Competent Authority, 2016) as well as professional judgement in the context of the Proposed Development.

Table 15.2A: Key Terms and Definitions Relevant to this Chapter

TERM	DEFINITION
Consultation Zone	The Health & Safety Executive (HSE) sets a Consultation Distance (CD) around major hazard sites and major accident hazard pipelines after assessing the risks and likely effects of major accidents at the major hazard site/pipeline. The area enclosed within the CD is referred to as the consultation zone. The Local Planning Authority is notified of this CD and has a statutory duty to consult HSE on certain proposed developments within the zone the CD forms.
Disaster	In the context of the Proposed Development, a naturally occurring phenomenon such as an extreme weather event (for example storm, flood, temperature) or ground-related hazard events (for example subsidence, landslide, earthquake) with the potential to cause an event or situation that meets the definition of a Major Accident as defined above.
External Influencing Factor	A factor which occurs beyond the limits of the Proposed Development that may present a risk to the Proposed Development, e.g. if an external disaster occurred (e.g. earthquake, COMAH site major accident) it would increase the risk of serious damage to an environmental receptor associated with the Proposed Development.
Hazard	Anything with the potential to cause harm, including ill-health and injury, damage to property or the environment; or a combination of these.
Internal Influencing Factor	A factor which occurs within the limits of the Proposed Development that may present a risk to the Proposed Development.
(Major) Accident	In the context of the Proposed Development, an event that threatens immediate or delayed serious damage to human health, welfare and/or the environment and requires the use of resources beyond those of the Applicant or its contractors to respond to the event. Serious damage includes the loss of life or permanent injury and/or permanent or long-lasting damage to an environmental receptor that cannot be restored through minor clean-up and restoration efforts. The significance of this effect will take into account the extent, severity and duration of harm and the sensitivity of the receptor.
Major Event	A term used to encompass both the term "Major Accident" and the term "Disaster".
Risk	The likelihood of an impact occurring combined with effect or consequence(s) of the impact on a receptor if it does occur.
Risk Event	An identified, unplanned event, which is considered relevant to the Proposed Development and has the potential to be a Major Accident and/or Disaster subject to assessment of its potential to result in a significant adverse effect on an environmental receptor.

TERM	DEFINITION
Vulnerability	In the context of the 2014 EU Directive, the term refers to the 'exposure and resilience' of the Proposed Development to the risk of a major accident and/or disaster. Vulnerability is influenced by sensitivity, adaptive capacity and magnitude of impact.

Methodology

- 15.8 There is no published guidance for the application of the legal requirements to the assessment of MA&D. However, selected relevant guidance for risk assessment methodologies has been adopted and is summarised as follows:
- IEMA (2020) Major Accidents and Disasters in EIA: A Primer;
 - Defra (2011) 'Guidelines for Environmental Risk Assessment and Management;
 - Chemical and Downstream Oil Industries Forum, (2013), Guideline – Environmental Risk Tolerability for COMAH Establishments; and
 - The International Standards Organization's ISO 31000: 2018 Risk Management – principles and guidelines.
- 15.9 In addition, the following have been consulted to support the identification of a potential MA&D:
- The Cabinet Office National Risk Register of Civil Emergencies (HM Government, 2021). This document is the unclassified version of the National Risk Register and it identifies the main types of civil emergencies that could affect the UK in the next five years. It is recognised, however, that this document does not provide an all-encompassing list of all potential accidents and disasters and its timescales are short term.
 - The International Federation of Red Cross & Red Crescent Societies Early Warning, Early Action (2008) (The International Federation of Red Cross & Red Crescent Societies, 2008). This guidance looks to other countries including those in warmer climates, thereby identifying risks that the UK may encounter in the future in light of climate change and global warming.
 - The International Disaster Database (The Centre for Research on the Epidemiology of Disasters, 2021). This online source contains data covering over 22,000 mass disasters in the world since 1900 to the present day and aims to "rationalise decision making for disaster preparedness, as well as provide an objective base for vulnerability assessment and priority setting".
- ### Scoping Methodology
- 15.10 Low likelihood and low consequence events will be scoped out as these events are unlikely to result in significant adverse effects as they do not fall into the definition of a MA&D. Highly likely and low consequence events are also scoped out as they will not lead to significant adverse effects. Furthermore, high likelihood and high consequence events are scoped out, as it is assumed that existing legislation and regulatory controls (including the Health and Safety at Work etc. Act 1974; the Construction (Design and Management) Regulations 2015 (CDM); and Pipelines Safety Regulations 1996) would not permit the project to be progressed under these circumstances.
- 15.11 A four-stage process will be used to identify the MA&D categories and types that require further assessment:

- The first stage is in accordance with emerging EIA practice, whereby health and safety is scoped out of this topic as it is covered by detailed health and safety legislation; this includes risks to employees;
- The second stage of the scoping process is the development of a long list of potential MA&D types for consideration;
- The third stage is the review of the long list to rule out any potential accidents and disasters that are considered not to be relevant to the location; and
- The final fourth stage is to rule out those which are unlikely to result in a MA&D event, e.g. there is no pathway or receptor.

Study Area

15.12 Major accident(s) and / or disaster(s) types would be considered both within and outside the Proposed Development boundary along with potential internal and external influencing factors. The following factors and associated distances were adopted for setting the study area:

- Manmade features:
 - Airports and airfields within 13km (the legal distance of the safeguarding zone for licensed airports in the UK);
 - COMAH facilities within 500m (distance to furthest COMAH installation centre point whose CZ overlaps the Proposed Development);
 - MAH pipelines within 500m (distance to furthest MAH pipeline whose CZ overlaps the Proposed Development);
 - Fuel retail sites (including Liquified Natural Gas, Liquified Petroleum Gas) within 500m;
 - Rail infrastructure within 100m; and
 - Transmission lines (gas, electrical, oil / fuels) crossing the Proposed Development boundary.
- Natural features with the potential to create risks within:
 - 3km (chiefly hydrological and geological, for example dam failure and seismic activity respectively); and
 - 1km (chiefly hydrological and geological, for example flood risk and unstable ground conditions respectively).

Receptors

15.13 In line with Regulation 14 of the EIA Regulations, the scoping study will consider the following receptors:

- Members of the public and local communities;
- Infrastructure and the built environment;
- The natural environment, including ecosystems, land and soil quality, air quality, surface and groundwater resources and landscape;
- The historic environment, including archaeology and built heritage; and
- The interaction between the factors above.

15.14 The environmental receptors of the Proposed Development are described in detail in the technical chapters (chapters 6 to 15) and so are not repeated here.

- 15.15 A review of the accident and disaster event groups, categories and types identified in the Study Area, has been undertaken to inform the scoping process which is reported in **Table 15.3A**. This table shows the potential vulnerability of the Proposed Development to the risk of a Major Accident and/or Disaster event at the type level. For the topic areas scoped in, further assessment will be undertaken in this chapter and for those that are scoped out, no further assessment is considered necessary in the EIA.

Table 15.3A: MA&D Types Scoped in or Out of Further Assessment

MAJOR EVENT GROUP	MAJOR EVENT CATEGORY	MAJOR EVENT TYPE	TOPIC CHAPTER(S) WITH RELEVANT INFORMATION	RELEVANT TO SCHEME AREA	PHASES WHICH EXACERBATE VULNERABILITY, (C=CONSTRUCTION, O=OPERATION)	POTENTIAL RECEPTORS	BASIS OF DECISION TO SCOPE IN/OUT	SCOPE IN?
Natural Hazards	Geophysical	Earthquakes	N/A	N	N/A	N/A	Do not occur in Britain of a sufficient intensity owing to the motion of the Earth's tectonic plates causing regional compression. In addition, uplift from the melting of the ice sheets that covered many parts of Britain thousands of years ago can also cause movement. The BGS acknowledges that on average, a magnitude 4 earthquake happens in Britain roughly every two years and a magnitude 5 earthquake occurs around every 10 to 20 years. As such, the Cabinet Office National Risk Register of Civil Emergencies states that "Earthquakes in the UK are moderately frequent but rarely result in large amounts of damage. An earthquake of sufficient intensity (determined on the basis of the earthquake's local effect on people and the environment) to inflict severe damage is unlikely".	N
Natural Hazards	Geophysical	Volcanic Activity	N/A	N	N/A	N/A	The Proposed Development is not in or close to an active area.	N
Natural Hazards	Geophysical	Landslides	Chapter 8: Flood Risk and Drainage (Scoping Report) Chapter 9: Flood Risk and Drainage (ES)	Y	C,O	Workers Road Users Public and local community	The Proposed Development is not in an active area and it is highly unlikely that an ash cloud could significantly impact on any aspect of the Proposed Development. The effects of potential landslides are unlikely given that the topography of the area is generally flat. In addition, the Proposed Development does not involve the formation of deep cuts/high embankments.	N

MAJOR EVENT GROUP	MAJOR EVENT CATEGORY	MAJOR EVENT TYPE	TOPIC CHAPTER(S) WITH RELEVANT INFORMATION	RELEVANT TO SCHEME AREA	PHASES WHICH EXACERBATE VULNERABILITY, (C=CONSTRUCTION, O=OPERATION)	POTENTIAL RECEPTORS	BASIS OF DECISION TO SCOPE IN/OUT	SCOPE IN?
Natural Hazards	Geophysical	Sinkholes	Chapter 8: Flood Risk and Drainage (Scoping Report) Chapter 9: Flood Risk and Drainage (ES)	Y	C,O	Workers Road Users Public and local community	The Site of the Proposed Development sits upon freely draining lime-rich loamy soils. However, the bedrock geology underlying the Site is Chalk. Chalk is a permeable rock where the flow of water into the ground can cause the rock to dissolve. It is noted that the Chalk Formation is potentially vulnerable to the formation of sinkholes. However, this is likely to be covered in the geotechnical design, and there are no examples of areas that have been affected by sinkholes in the locality to warrant taking this event forward.	N
Natural Hazards	Geophysical	Tsunamis	N/A	N	N/A	N/A	The Proposed Development is located inland, outside a tsunamis risk zone.	N
Natural Hazards	Hydrology	Coastal Flooding	Chapter 8: Flood Risk and Drainage (Scoping Report) Chapter 9: Flood Risk and Drainage (ES)	N	N/A	N/A	The Proposed Development is located inland, outside a coastal area.	N
Natural Hazards	Hydrology	Fluvial Flooding	Chapter 8: Flood Risk and Drainage (Scoping Report) Chapter 9: Flood Risk and Drainage (ES)	Y	C,O	Aquatic environment and ecological receptors Properties Road Users Public and local community	The Site is located within Flood Zone 1, indicating a low probability of flooding. Consultation undertaken with ECC for flooding information identified no records of the Site being affected by flooding or the surrounding 250m area. Historical flood maps available as open data from the Environment Agency confirm this as the Site is well removed from historic flood events occurring in 1917, 1960, 2001 and 2014. Local surface water features include a minor water course flowing through the northern section of the Site, and the River Slade 567m from the Proposed Development Site.	N

MAJOR EVENT GROUP	MAJOR EVENT CATEGORY	MAJOR EVENT TYPE	TOPIC CHAPTER(S) WITH RELEVANT INFORMATION	RELEVANT TO SCHEME AREA	PHASES WHICH EXACERBATE VULNERABILITY, (C=CONSTRUCTION, O=OPERATION)	POTENTIAL RECEPTORS	BASIS OF DECISION TO SCOPE IN/OUT	SCOPE IN?
Natural Hazards	Hydrology	Pluvial Flooding	Chapter 8: Flood Risk and Drainage (Scoping Report) Chapter 9: Flood Risk and Drainage (ES)	Y	C, O	Aquatic environment and ecological receptors Properties Road Users Public and local community	<p>A Surface Water (Pluvial) Flood map provided by the Environment Agency indicates that the Site is predominantly at very low risk of pluvial flooding. Areas of potential low risk are most notably within the north associated with the minor watercourse present.</p> <p>The drainage strategy for the Proposed Development will result in a betterment to the rate of runoff received by the watercourse at present and ultimately to the downstream catchment and surrounding land. The drainage strategy has been designed to ensure that the Proposed Development does not cause an increase in flood risk elsewhere. This will be achieved through restricting the discharge rate to the annual average storm event and therefore, runoff rates are managed in a more controlled manner compared to the existing natural drainage processes.</p> <p>In addition, the drainage system has been designed with an allowance for the future effects of climate change.</p> <p>On this basis, pluvial flooding has been scoped out of the MA&D assessment.</p>	N
Natural Hazards	Hydrology	Groundwater Flooding	Chapter 8: Flood Risk and Drainage (Scoping Report) Chapter 9: Flood Risk and Drainage (ES)	N	N/A	N/A	<p>Mapping available from the Department for Environment, Food & Rural Affairs (DEFRA) Magic Mapping Service shows that the Site is located in a Principal Bedrock Aquifer, and a Secondary (undifferentiated) Superficial Drift Aquifer. However, the Strategic Flood Risk Assessment (SFRA) contains no reference to groundwater flooding at Saffron Walden or close to the area of the Proposed Development, as such, the groundwater flood risk is considered to be low.</p>	N
Natural Hazards	Hydrology	Avalanches	N/A	N	N/A	N/A	Not considered relevant given the geographical location of the Proposed Development. The topography of the Site is relatively flat and therefore an avalanche will not occur.	N

MAJOR EVENT GROUP	MAJOR EVENT CATEGORY	MAJOR EVENT TYPE	TOPIC CHAPTER(S) WITH RELEVANT INFORMATION	RELEVANT TO SCHEME AREA	PHASES WHICH EXACERBATE VULNERABILITY, (C=CONSTRUCTION, O=OPERATION)	POTENTIAL RECEPTORS	BASIS OF DECISION TO SCOPE IN/OUT	SCOPE IN?
Natural Hazards	Climatological and Meteorological	Cyclones, hurricanes, typhoons, storms and gales	N/A	Y	C,O	Property Workers Road Users	Cyclones, hurricanes and typhoons do not occur in the UK. The winter of 2015/2016 was the second wettest winter on record and a series of storms (including 'Desmond' and 'Eva') resulted in heavy and sustained rainfall. 17,600 UK properties were flooded and several bridges collapsed, disrupting access to and from local communities. Storms and gales could result in damage to infrastructure and could affect journeys made by road users; however, the risk is no different to other similar developments in the locality.	N
Natural Hazards	Climatological and Meteorological	Thunderstorms	N/A	Y	C,O	Workers	This type of event could result in lightning strikes to temporary elevated structures during construction (e.g. tower cranes) and new elevated structures (such as bridges) introduced as part of the development; however, the risk is no different to similar housing developments in the locality. Specific measures are, therefore, not considered to be required as part of the Proposed Development.	N
Natural Hazards	Climatological and Meteorological	Wave surges	N/A	N	N/A	N/A	The Proposed Development is located sufficiently inland and, therefore, is not subject to wave surges.	N

MAJOR EVENT GROUP	MAJOR EVENT CATEGORY	MAJOR EVENT TYPE	TOPIC CHAPTER(S) WITH RELEVANT INFORMATION	RELEVANT TO SCHEME AREA	PHASES WHICH EXACERBATE VULNERABILITY, (C=CONSTRUCTION, O=OPERATION)	POTENTIAL RECEPTORS	BASIS OF DECISION TO SCOPE IN/OUT	SCOPE IN?
Natural Hazards	Climatological and Meteorological	Extreme temperatures: Heatwaves Low (sub-zero) temperatures and heavy snow	N/A	Y	N/A	N/A	<p>This type of event could give rise to changes in climatic conditions, with infrastructure exposed to greater heat intensity and exposure to sunlight. Heavy snow could cause workers and road users to be trapped on the highway.</p> <p>In August 1990, the UK experienced heatwave conditions with temperatures reaching what was then a record 37.1°C in Cheltenham, England. In August 2003, a UK heatwave lasted 10 days and resulted in over 2,000 deaths. Temperatures reached what was then a record 38.5°C in Faversham, England and 33°C in Anglesey, Wales. High temperature records are now being broken with increasing frequency.</p> <p>The most widespread and prolonged low temperatures and heavy snow in recent years occurred from December 2009 to January 2010. Daytime temperatures were mostly sub-zero across the UK. At night, temperatures in England regularly fell to -5°C to -10°C. Snowfall across the UK lasted for some time, allowing 20cm to 30cm of snow to build up, closing schools and making it very difficult to travel.</p> <p>Between 1981 and 2010, there have been 65 occurrences where summer mean temperatures exceeded 18.48°C on five or more consecutive days.</p> <p>Between 1981 and 2010, there have been 1,753 days with a maximum minimum temperature below zero degrees Celsius.</p> <p>Between 1981 and 2010, there were 228 days with snow lying at 0900 hours however, there are no records from the Met Office of the depth of snow.</p>	N

MAJOR EVENT GROUP	MAJOR EVENT CATEGORY	MAJOR EVENT TYPE	TOPIC CHAPTER(S) WITH RELEVANT INFORMATION	RELEVANT TO SCHEME AREA	PHASES WHICH EXACERBATE VULNERABILITY (C=CONSTRUCTION, O=OPERATION)	POTENTIAL RECEPTORS	BASIS OF DECISION TO SCOPE IN/OUT	SCOPE IN?
							Extremely hot and cold weather could affect the comfort and health of users of the Proposed Development, and has the potential to pose a risk to Proposed Development assets such as deformation and deterioration of materials (asphalt) surfacing. However, as this effect is no different to similar housing developments or users in the locality, the effect is not considered to be significant. Therefore, specific measures are not required as part of the Proposed Development.	
Natural Hazards	Climatological and Meteorological	Droughts	N/A	Y	C,O	People Properties Workers Road users	The Proposed Development should not be vulnerable to drought as water is not an essential service during the construction, use or maintenance phases. Prolonged periods of drought can impact infrastructure as drying out and cracking of soils may affect structural stability and prolonged dry periods can lead to cracking of surfaces and more rapid deterioration of materials. Decreased rainfall combined with an increase in the average temperature can also increase subsidence, affecting the stability of foundations, including pavements and hard surfaces. The construction of the Proposed Development will follow good engineering practice taking into consideration future climatic changes (including drought) and will be resilient to ground shrinkage and this event type should remain in the design risk register until designed out.	N
Natural Hazards	Climatological and Meteorological	Severe Space Weather: Solar Flares	Chapter 3: Proposed Development (scoping) Chapter 4: Proposed Development including Alternatives (ES)	N	N/A	N/A	Solar flare events are known to interrupt radio and other electronic communications. Records from solar storms in 1921 and 1960 describe widespread radio disruption and impacts on railway signalling and switching systems. There is no increased reliance on technology during the construction of the Proposed Development.	N

MAJOR EVENT GROUP	MAJOR EVENT CATEGORY	MAJOR EVENT TYPE	TOPIC CHAPTER(S) WITH RELEVANT INFORMATION	RELEVANT TO SCHEME AREA	PHASES WHICH EXACERBATE VULNERABILITY, (C=CONSTRUCTION, O=OPERATION)	POTENTIAL RECEPTORS	BASIS OF DECISION TO SCOPE IN/OUT	SCOPE IN?
Natural Hazards	Climatological and Meteorological	Severe Space Weather: Solar Energetic Particles	N/A	N	N/A	N/A	Solar flare events are known to interrupt radio and other electronic communications. Records from solar storms in 1921 and 1960 describe widespread radio disruption and impacts on railway signalling and switching systems. There is no increased reliance on technology during the construction of the Proposed Development.	N
Natural Hazards	Climatological and Meteorological	Severe Space Weather: Coronal Mass Ejections	N/A	N	N/A	N/A	Coronal mass ejections (CME) cause geomagnetic storms. The geomagnetic storm in 2003 caused the UK aviation sector to lose some GPS functions for a day, however there are no known significant impacts to infrastructure and construction projects.	N
Natural Hazards	Climatological and Meteorological	Fog	Chapter 3: Proposed Development (scoping) Chapter 4: Proposed Development including Alternatives (ES)	N	N/A	N/A	Fog is one of the most common weather conditions in the UK, particularly throughout autumn and winter. Severe disruption to transport occurs when the visibility falls below 50m over a wide area. However, the risk for the Proposed Development should be no higher than other housing developments elsewhere in the UK. In addition, the risk of collision from moving vehicles on site is low.	N
Natural Hazards	Climatological and Meteorological	Wildfires: Forest fire, Bush/brush, pasture	Chapter 3: Proposed Development (scoping) Chapter 4: Proposed Development including Alternatives (ES)	Y	C,O	Ecological receptors Properties Workers Road users	The development is surrounded by agricultural land which has a low risk of wildfire events during hot, dry periods and/or fires initiated by construction related activities as opposed to areas of woodland. During construction, standard control measures would be implemented by the appointed contractor to manage the risk of fire. During operation, however, the risk is no different to other housing developments in the locality. Specific measures are, therefore, not considered to be required as part of the Proposed Development.	N

MAJOR EVENT GROUP	MAJOR EVENT CATEGORY	MAJOR EVENT TYPE	TOPIC CHAPTER(S) WITH RELEVANT INFORMATION	RELEVANT TO SCHEME AREA	PHASES WHICH EXACERBATE VULNERABILITY, (C=CONSTRUCTION, O=OPERATION)	POTENTIAL RECEPTORS	BASIS OF DECISION TO SCOPE IN/OUT	SCOPE IN?
Natural Hazards	Climatological and Meteorological	Poor Air Quality	Chapter 7: Air Quality (ES)	Y	C,O	Ecological receptors People Workers Road users	<p>Construction Phase: There is the potential for significant impacts during construction at sensitive receptors within 350m of the Site arising from the use of site equipment and materials. There is also the potential for significant impacts on local air quality from construction traffic travelling to and from the Site along Radwinter Road and through the adjoining development areas. Construction vehicles include a high proportion of heavy-duty vehicles, which can generate higher emissions, and in conjunction with trips associated with other developments being constructed at the same time, can result in significant impacts on local air quality, all be it of a temporary and short-term nature. The most significant impacts are likely to occur at those receptors closest to the Site including properties to the west within the new development areas at Griffin Place, Leverett Way, Sativus Close and Fairfax Drive. The most sensitive receptors will be residential properties in these locations. The air quality environmental statement concluded that the effects associated with construction traffic are negligible and the effects associated with construction dust are moderate-adverse, however, these impacts will be short term, temporary and reversible. Therefore, no further assessment is required from a MA&D perspective.</p> <p>Operational Phase: The operational phase will generate additional vehicle movements on the adjacent road network, including within the Saffron Walden Air Quality Management Area (AQMA). There is the potential for these additional vehicle movements to result in a significant impact on air quality within the AQMA, particularly in conjunction with traffic generated by other committed development in the area. The main receptors of concern will be residential properties, educational facilities and health/community related facilities located close to the main road network where traffic flows are likely to be most significant.</p>	N

MAJOR EVENT GROUP	MAJOR EVENT CATEGORY	MAJOR EVENT TYPE	TOPIC CHAPTER(S) WITH RELEVANT INFORMATION	RELEVANT TO SCHEME AREA	PHASES WHICH EXACERBATE VULNERABILITY, (C=CONSTRUCTION, O=OPERATION)	POTENTIAL RECEPTORS	BASIS OF DECISION TO SCOPE IN/OUT	SCOPE IN?
							However, the air quality environmental statement concludes that the impact of the Proposed Development will be negligible. Therefore, no further assessment is required from a MA&D perspective.	
Natural Hazards	Biological	Disease epidemics: - Viral - Bacterial - Parasitic - Fungal - Prion	Chapter 11: Socio-Economics and Health (Scoping) Chapter 12: Socio-Economics and Health (ES)	Y	C	People Workers	<p>The Proposed Development is to be located in a developed country where the population is in general good health. Disease epidemics in England are currently limited to COVID-19, the first cases of which were identified in February 2020. COVID-19 is currently a global pandemic, and the vulnerability of the Proposed Development to a major event caused by this pandemic during construction and operation should be mitigated by the occupational health and safety processes that are implemented by both the contractor and government rules and guidelines on the control of spread of COVID-19.</p> <p>The UK Health Security Agency, the executive agency of the Department of Health and Social Care is responsible for protecting the nation from public health hazards, preparing for and responding to public health emergencies. One of the UK Health Security Agency's functions is to protect the public from infectious disease outbreaks and the Agency has produced a document providing operational guidance for the management of outbreaks of communicable disease, 'Communicable Disease Outbreak management: Operational Guidance'. Furthermore, the Proposed Development itself is not going to give rise to any disease epidemics and, therefore, further assessment is not required.</p>	N

MAJOR EVENT GROUP	MAJOR EVENT CATEGORY	MAJOR EVENT TYPE	TOPIC CHAPTER(S) WITH RELEVANT INFORMATION	RELEVANT TO SCHEME AREA	PHASES WHICH EXACERBATE VULNERABILITY, (C=CONSTRUCTION, O=OPERATION)	POTENTIAL RECEPTORS	BASIS OF DECISION TO SCOPE IN/OUT	SCOPE IN?
Natural Hazards	Biological	Animal Diseases: - zoonotic: • avian influenza • West Nile virus • Rabies - non-zoonotic: • foot and mouth • swine fever	Chapter 11: Socio-Economics and Health (Scoping) Chapter 12: Socio-Economics and Health (ES)	Y	C	Aquatic and ecological receptors People Workers	Low and highly pathogenic avian influenza has been recorded in poultry in the UK several times in the last 10 years, most recently in the winter of 2016/17 and 2021, although with no human cases reported. There was a devastating foot and mouth outbreak in 2001. It is likely the major event will be scoped out as the use of the development is not going to be the source of any disease epidemics and spread would be controlled through containment of infected animals including prohibition of transportation. There are no known foot and mouth burial pits within the Proposed Development area.	N
Natural Hazards	Biological	Plants	Chapter 8: Ecology (ES)	N	N/A	N/A	Initial baseline data does not identify any invasive/dangerous/regulated plants. Standard control measures would be implemented by the appointed contractor during construction to handle and dispose of any diseased plants and/or injurious weeds, and prevent their spread.	N
Technological or Manmade Hazards	Societal	Extensive public demonstrations which could lead to violence and loss of life.	N/A	N	N/A	N/A	The Proposed Development is located in a developed country that has steady, yet small population growth. England is politically stable with no direct border with countries experiencing conflicts. The Proposed Development is not considered highly controversial and should not lead to high profile public demonstrations.	N
Technological or Manmade Hazards	Societal	Widespread damage to societies and economies.	N/A	N	N/A	N/A	The Proposed Development is located in a developed country that has steady, yet small population growth. England is politically stable with no direct border with countries experiencing conflicts.	N

MAJOR EVENT GROUP	MAJOR EVENT CATEGORY	MAJOR EVENT TYPE	TOPIC CHAPTER(S) WITH RELEVANT INFORMATION	RELEVANT TO SCHEME AREA	PHASES WHICH EXACERBATE VULNERABILITY (C=CONSTRUCTION, O=OPERATION)	POTENTIAL RECEPTORS	BASIS OF DECISION TO SCOPE IN/OUT	SCOPE IN?
Technological or Manmade Hazards	Societal	The need for large-scale multi-faceted humanitarian assistance.	N/A	N	N/A	N/A	The Proposed Development is located in a developed country that has steady, yet small population growth. England is politically stable with no direct border with countries experiencing conflicts.	N
Technological or Manmade Hazards	Societal	The hindrance or prevention of humanitarian assistance by political and military constraints.	N/A	N	N/A	N/A	The Proposed Development is located in a developed country that has steady, yet small population growth. England is politically stable with no direct border with countries experiencing conflicts.	N
Technological or Manmade Hazards	Societal	Significant security risks for humanitarian relief workers in some areas.	N/A	N	N/A	N/A	The Proposed Development is located in a developed country that has steady, yet small population growth. England is politically stable with no direct border with countries experiencing conflicts.	N
Technological or Manmade Hazards	Societal	Famine	N/A	N	N/A	N/A	The Proposed Development is located in a developed country that produces its own crops and imports food. It is politically stable and not subject to hyperinflation and, therefore, food is available, whether produced within the UK or imported. Famine is also not relevant to the use of the Proposed Development.	N

MAJOR EVENT GROUP	MAJOR EVENT CATEGORY	MAJOR EVENT TYPE	TOPIC CHAPTER(S) WITH RELEVANT INFORMATION	RELEVANT TO SCHEME AREA	PHASES WHICH EXACERBATE VULNERABILITY, (C=CONSTRUCTION, O=OPERATION)	POTENTIAL RECEPTORS	BASIS OF DECISION TO SCOPE IN/OUT	SCOPE IN?
Technological or Manmade Hazards	Societal	Displaced population	N/A	N	N/A	N/A	There will be no displacement of populations as part of the Proposed Development.	N
Technological or Manmade Hazards	Industrial and Urban Accidents	Major Accident Hazard Chemical sites	N/A	Y	C,O	Road users Public and local communities	According to COMAH 2015 public information, the Site of the Proposed Development is within the consultation distance of the Exolum Pipeline System Limited fuel storage depot which is classified as a Lower Tier COMAH site. It crosses the inner, middle and outer zones of the major hazard site. The Applicant has consulted with the HSE who have advised that, based on the information supplied, the HSE would not advise against the development as long as there was only sensitivity level one development (e.g. landscaping) within the combined inner zone. This event type should remain in the design risk register to ensure that the requirements of the HSE are formally reflected within the design of the Proposed Development and on this basis further assessment is not required in the ES.	N
Technological or Manmade Hazards	Industrial and Urban Accidents	Major Accident Hazard Pipelines	Utilities Appraisal	N	C	Road users Public and local communities	According to COMAH 2015 public information, the Site of the Proposed Development currently lies within the consultation distance of a major accident hazard pipeline operated by Exolum Pipeline Systems Ltd. Further information noted in the Utilities Appraisal carried out by Cotswold Transport Planning implies the major accident hazard pipeline is comprised of two live pipelines through the Site. The appraisal also includes information on two recorded abandoned MOD pipelines. The first is located close to, and following the same route, as the live line. The second is up to approximately 50m further east. The Proposed Development could be vulnerable to the effects from a major accident associated with the pipeline(s). The Applicant has consulted with Exolum and the HSE who have no objections to the Proposed Development as long as appropriate measures are put	N

MAJOR EVENT GROUP	MAJOR EVENT CATEGORY	MAJOR EVENT TYPE	TOPIC CHAPTER(S) WITH RELEVANT INFORMATION	RELEVANT TO SCHEME AREA	PHASES WHICH EXACERBATE VULNERABILITY, (C=CONSTRUCTION, O=OPERATION)	POTENTIAL RECEPTORS	BASIS OF DECISION TO SCOPE IN/OUT	SCOPE IN?
							in place to safeguard the pipeline. This event type should remain in the design risk register until further consultation has been undertaken and, if necessary, appropriate agreed mitigation measures put in place in agreement with Exolum and the HSE.	
Technological or Manmade Hazards	Industrial and Urban Accidents	Nuclear	N/A	N	N/A	N/A	Nuclear sites are designed, built and operated so that the chance of accidental releases of radiological material in the UK is extremely low. Last historical major accident in the UK was Windscale in 1957. There are no nuclear sites located near the Proposed Development.	N
Technological or Manmade Hazards	Industrial and Urban Accidents	Fuel storage	N/A	Y	C, O	Road users Public and local communities	<p>In December 2005, Europe's largest peacetime fire occurred at the Buncefield Oil Storage Terminal in Hemel Hempstead, England. The surrounding area was temporarily evacuated and some local businesses experienced long-term disruption to their activities/operations.</p> <p>There is a fuel storage depot immediately north of Radwinter Road, details of which are outlined above under the Major Accident Hazard Chemical Sites risk event type. The northern part of the Proposed Development site crosses all three of the consultation zones associated with the Exolum Pipeline System Limited fuel storage depot. During consultation with the HSE, it was advised that the HSE would not advise against the development as long as there was only sensitivity level one development (e.g. landscaping) within the combined inner zone.</p> <p>In addition, one petrol station, approximately 300m west of the Proposed Development's boundary (Tesco). Further assessment is not required in the ES as the inventory of fuel held on site is relatively small (i.e. below COMAH thresholds) and the hazardous area classification zones will not extend beyond the petrol station boundary. Therefore, further assessment in the ES is not required.</p>	N

MAJOR EVENT GROUP	MAJOR EVENT CATEGORY	MAJOR EVENT TYPE	TOPIC CHAPTER(S) WITH RELEVANT INFORMATION	RELEVANT TO SCHEME AREA	PHASES WHICH EXACERBATE VULNERABILITY (C=CONSTRUCTION, O=OPERATION)	POTENTIAL RECEPTORS	BASIS OF DECISION TO SCOPE IN/OUT	SCOPE IN?
Technological or Manmade Hazards	Industrial and Urban Accidents	Dam breaches	Chapter 8: Flood Risk and Drainage (Scoping Report) Chapter 9: Flood Risk and Drainage (ES)	N	N/A	N/A	Dam breaches in the UK are rare; the last major breach was at the Cwm Eigiau dam in 1925, which caused 17 fatalities and widespread flooding. Grafham water reservoir is located approximately 34km from the Site, it is the eighth largest reservoir in England by volume and created by building an earth and concrete dam in 1965. No dam has been identified within 5km of the Proposed Development.	N
Technological or Manmade Hazards	Industrial and Urban Accidents	Mines and storage caverns	NA	N	N/A	N/A	Coal Authority records state that there are no coal workings within the Proposed Development footprint.	N
Technological or Manmade Hazards	Industrial and Urban Accidents	Fires	N/A	Y	C,O	Cultural heritage sites People Road users	Fires could be initiated by construction related activities which impact areas adjacent to the construction activities. During construction, standard control measures would be implemented by the appointed contractor to manage the risk of fire. The risk of fires affecting the Proposed Development during operation is no greater than risks for existing developments in an urban environment.	N

MAJOR EVENT GROUP	MAJOR EVENT CATEGORY	MAJOR EVENT TYPE	TOPIC CHAPTER(S) WITH RELEVANT INFORMATION	RELEVANT TO SCHEME AREA	PHASES WHICH EXACERBATE VULNERABILITY, (C=CONSTRUCTION, O=OPERATION)	POTENTIAL RECEPTORS	BASIS OF DECISION TO SCOPE IN/OUT	SCOPE IN?
Technological or Manmade Hazards	Transport accidents	Road	Chapter 13: Transport (ES)	Y	C,O	<p>Aquatic environment and ecological receptors</p> <p>Properties</p> <p>Workers</p> <p>Road users</p>	<p>Significant transport accidents occur across the UK on a daily basis, mainly on roads, and involving private and/or commercial vehicles.</p> <p>Construction: During construction there will be an increase in heavy construction plant and equipment on the local road network, in particular, Radwinter Road which may increase the risk of accidents. During peak construction it is anticipated that there could be up to 30 HGV movements to the Site each day and up to 100 light vehicles. HGV movements would be dispersed across the day outside of peak periods and, where possible, light vehicles will also avoid peak periods. The impact associated with construction traffic will be temporary and, therefore, further assessment is not considered necessary.</p> <p>It is not envisaged that the construction of the Proposed Development would generate or attract any hazardous loads.</p> <p>Operation: Accident data shows that the level of reported accidents is not uncommon for this type of location. The majority of the accidents were caused by human error. The increases in traffic flow as a result of the Proposed Development may lead to some increase in accidents. However, as existing accidents are not associated with traffic flow, there is no direct relationship between the increased flows and increased traffic accidents. Therefore, it is concluded that the overall significance of impact on accidents and safety will be minor adverse and would not constitute a MA&D.</p>	N

MAJOR EVENT GROUP	MAJOR EVENT CATEGORY	MAJOR EVENT TYPE	TOPIC CHAPTER(S) WITH RELEVANT INFORMATION	RELEVANT TO SCHEME AREA	PHASES WHICH EXACERBATE VULNERABILITY, (C=CONSTRUCTION, O=OPERATION)	POTENTIAL RECEPTORS	BASIS OF DECISION TO SCOPE IN/OUT	SCOPE IN?
Technological or Manmade Hazards	Transport accidents	Rail	Chapter 2: Site Context (Scoping) Chapter 3: Site Context (ES)	N	N/A	N/A	The nearest railway line, at Audley End, is over 4km south west of the Proposed Development. Therefore, further consideration in the ES is not required.	N
Technological or Manmade Hazards	Transport accidents	Waterways	Chapter 8: Flood Risk and Drainage (Scoping Report) Chapter 9: Flood Risk and Drainage (ES)	N	N/A	N/A	There are no waterways located in the Study Area used for significant transport by water that could impact the Proposed Development during construction and operational phases.	N
Technological or Manmade Hazards	Transport accidents	Aviation	Chapter 2: Site Context (Scoping) Chapter 3: Site Context (ES)	N	N/A	N/A	There have been no major air accidents in the UK since the Kegworth incident in 1989. The nearest airfield is Audley End Airfield approximately 3km south west of the Proposed Development. Public Safety Zones (PSZ) are areas at either end of the runway and development is restricted within these zones to minimise the risk of death or injury in the event of an aircraft accident on take-off or landing. The runway at Audley End Airfield runs north to south therefore, the PSZ associated with the airfield will not interact or be in close proximity to the Proposed Development. Therefore, further consideration is not required in the ES.	N

MAJOR EVENT GROUP	MAJOR EVENT CATEGORY	MAJOR EVENT TYPE	TOPIC CHAPTER(S) WITH RELEVANT INFORMATION	RELEVANT TO SCHEME AREA	PHASES WHICH EXACERBATE VULNERABILITY, (C=CONSTRUCTION, O=OPERATION)	POTENTIAL RECEPTORS	BASIS OF DECISION TO SCOPE IN/OUT	SCOPE IN?
Technological or Manmade Hazards	Pollution accidents	Air	Chapter 7: Air Quality (ES)	Y	C,O	People Road users	<p>Construction activities may cause dust emissions which may contribute to poor air quality albeit on a temporary basis.</p> <p>The use of fossil fuelled mobile plant and equipment during the construction phase may contribute to events associated with poor air quality. Guidance from the Institute of Air Quality Management (IAQM) notes that effects from on-site exhaust emission are unlikely to be significant. Also, given the local and temporary nature of the construction site, plant emissions are considered to have a negligible impact on local air quality, relative to the surrounding road traffic contribution on the local road networks.</p> <p>It is anticipated that construction traffic generated by the Proposed Development would result in a negligible impact on local NO₂ and PM₁₀ concentrations. In addition, impacts as a result of construction traffic would be temporary and short-term in nature.</p> <p>The air quality chapter of the Environmental Statement concludes that the impact on air quality associated with traffic generated by the Proposed Development is negligible.</p>	N
Technological or Manmade Hazards	Pollution accidents	Land	Chapter 6: Agriculture (Scoping & ES)	Y	C	Ecological receptors Local heritage Public and local community	<p>During construction there may be an increase in the risk of leaks and spillages of hazardous materials associated with the construction activities (e.g. fuel, asphalt, cement and associated additives). There is also the risk that any potential existing contamination may be disturbed. During construction, standard control measures would be implemented by the appointed contractor to manage the risk of spillages and leaks.</p>	N

MAJOR EVENT GROUP	MAJOR EVENT CATEGORY	MAJOR EVENT TYPE	TOPIC CHAPTER(S) WITH RELEVANT INFORMATION	RELEVANT TO SCHEME AREA	PHASES WHICH EXACERBATE VULNERABILITY, (C=CONSTRUCTION, O=OPERATION)	POTENTIAL RECEPTORS	BASIS OF DECISION TO SCOPE IN/OUT	SCOPE IN?
Technological or Manmade Hazards	Pollution accidents	Water	Chapter 8: Flood Risk and Drainage (Scoping Report) Chapter 9: Flood Risk and Drainage (ES)	Y	C	Public and local community Water environment	During construction, there may be an increase in the risk of leaks and spillages of hazardous materials associated with the construction activities. During construction, standard control measures would be implemented by the appointed contractor to manage the risk of spillages and leaks.	N
Technological or Manmade Hazards	Utilities failures	Electricity		Y	C	Public and local community Workers	Instances of electricity failure (also referred to as power loss or blackout) can be caused by a number of things, such as severe weather (e.g. very strong winds, lightning and flooding) which damage the distribution network. These tend to be mainly specific place, local (e.g. metropolitan area) and less frequently regional (e.g. North East) as a result of severe winter storms and consequent damage to the distribution overhead line network. UK Power Networks indicate an existing overhead high voltage line within the Site. The responsibilities of this asset lie with the relevant local operator or company should this infrastructure fail. Information regarding diversion works will be considered in the EIA, however, the potential risk of construction-related incidents when undertaking diversion works as part of the Proposed Development would be covered by existing legislation.	N

MAJOR EVENT GROUP	MAJOR EVENT CATEGORY	MAJOR EVENT TYPE	TOPIC CHAPTER(S) WITH RELEVANT INFORMATION	RELEVANT TO SCHEME AREA	PHASES WHICH EXACERBATE VULNERABILITY, (C=CONSTRUCTION, O=OPERATION)	POTENTIAL RECEPTORS	BASIS OF DECISION TO SCOPE IN/OUT	SCOPE IN?
Technological or Manmade Hazards	Utilities failures	Gas		Y	N/A	N/A	Cadent Gas records indicate an intermediate pressure (IP) gas main is routed through the Site along the south west boundary, heading north/north east before exiting the Site midway through the northern boundary. Should this infrastructure fail the responsibilities of underground and above-ground gas transmission pipelines present across the development lie with the relevant local operator or company. Information regarding diversion works will be considered in the EIA. The potential risk of construction-related incidents when undertaking diversion works as part of the Proposed Development would be covered by existing legislation.	N
Technological or Manmade Hazards	Utilities failures	Water supply	N/A	N	N/A	N/A	Affinity Water infrastructure mapping indicates no public water mains infrastructure present within the Site boundary. Should nearby infrastructure fail, responsibilities of the water mains infrastructure lie with the relevant local operator or company.	N
Technological or Manmade Hazards	Utilities failures	Sewage system	N/A	N	N/A	N/A	Anglian Water infrastructure mapping indicates a 180mm diameter public foul sewer within the Site. During construction, standard control measures would be implemented by the appointed contractor to manage this risk to the Site. In addition, during the construction phase, temporary portable systems will be in place covered by H&S welfare requirements. For these reasons, the associated risks to the Proposed Development of a MA&D are scoped out of the EIA. Should this infrastructure fail the responsibilities of the sewage network across the development lie with the relevant local operator or company.	N

MAJOR EVENT GROUP	MAJOR EVENT CATEGORY	MAJOR EVENT TYPE	TOPIC CHAPTER(S) WITH RELEVANT INFORMATION	RELEVANT TO SCHEME AREA	PHASES WHICH EXACERBATE VULNERABILITY, (C=CONSTRUCTION, O=OPERATION)	POTENTIAL RECEPTORS	BASIS OF DECISION TO SCOPE IN/OUT	SCOPE IN?
Technological or Manmade Hazards	Malicious Attacks	Unexploded Ordnance	N/A	Y	C	Property Public and local community Workers	There are two recorded abandoned MOD pipelines present within the Site. A low potential exists for encountering unexploded ordnance during construction of the Proposed Development. Measures would be undertaken during construction to brief operatives to raise awareness of this issue, and to define appropriate response strategies should this be discovered during the works. There would be a limited risk of unexploded ordnance affecting the Proposed Development once operational but no greater than similar schemes.	N
Technological or Manmade Hazards	Malicious Attacks	Attacks Chemical Biological Radiological Nuclear	N/A	N	N/A	N/A	Extremists remain interested in Chemical, Biological, Radiological and Nuclear (CBRN) materials, however, alternative methods of attack such as employing firearms or conventional explosive devices remain far more likely. Historical use has been in enclosed densely occupied structures (underground, buildings) or targeted at specific individuals. The Proposed Development is unlikely to be a target for this type of event due to the low number of exposed targets.	N
Technological or Manmade Hazards	Malicious Attacks	Transport systems	N/A	N	N/A	N/A	Potential systems would include (but are not limited to) railways, buses, passenger ferries, cargo vessels and aircraft. The Proposed Development is unlikely to be a target for this type of event due to the low number of exposed targets.	N
Technological or Manmade Hazards	Malicious Attacks	Crowded places	N/A	N	N/A	N/A	The Proposed Development does not fall within the definition of a crowded place, i.e. pedestrian routes and other thoroughfares as well as sports arenas, retail outlets and entertainment spaces. The Proposed Development is unlikely to be a target for this type of event due to the low number of exposed targets.	N

MAJOR EVENT GROUP	MAJOR EVENT CATEGORY	MAJOR EVENT TYPE	TOPIC CHAPTER(S) WITH RELEVANT INFORMATION	RELEVANT TO SCHEME AREA	PHASES WHICH EXACERBATE VULNERABILITY (C=CONSTRUCTION, O=OPERATION)	POTENTIAL RECEPTORS	BASIS OF DECISION TO SCOPE IN/OUT	SCOPE IN?
Technological or Manmade Hazards	Malicious Attacks	Cyber	N/A	N	N/A	N/A	Cyber-attacks occur almost constantly on key national and commercial electronic information, control systems and digital industries. The resilience of the UK to national security risks, including terrorism, cyber-attack, natural hazards and other risks are outlined in the National Risk Assessment. The Proposed Development is not reliant on technology.	N
Technological or Manmade Hazards	Malicious Attacks	Infrastructure	N/A	N	N/A	N/A	Terrorists in the UK have previously attacked, or planned to attack, national infrastructure. Attempts were made to attack electricity substations in the 1990s. Bishopsgate, in the City of London, was attacked in 1993 and South Quay in London's Docklands in 1996. These attacks resulted in significant damage and disruption but relatively few casualties. The Proposed Development would have minimal impact on local infrastructure and would not be considered a high profile target for attack.	N
Technological or Manmade Hazards	Engineering accidents and failures	Bridge failure	N/A	N	N/A	N/A	Bridge works are not proposed as part of the Proposed Development.	N
Technological or Manmade Hazards	Engineering accidents and failures	Flood defence failure	Chapter 8: Flood Risk and Drainage (Scoping Report) Chapter 9: Flood Risk and Drainage (ES)	N	N/A	N/A	The Study Area associated with the Proposed Development does not benefit from flood defences or flood storage areas. The design of the Proposed Development has been developed to include allowances for future climate change predictions that could result in flooding.	N

MAJOR EVENT GROUP	MAJOR EVENT CATEGORY	MAJOR EVENT TYPE	TOPIC CHAPTER(S) WITH RELEVANT INFORMATION	RELEVANT TO SCHEME AREA	PHASES WHICH EXACERBATE VULNERABILITY, (C=CONSTRUCTION, O=OPERATION)	POTENTIAL RECEPTORS	BASIS OF DECISION TO SCOPE IN/OUT	SCOPE IN?
Technological or Manmade Hazards	Engineering accidents and failures	Mast and tower collapse	N/A	N	N/A	N/A	There are no towers or masts in close proximity to the Proposed Development or being built as part of the Proposed Development.	N
Technological or Manmade Hazards	Engineering accidents and failures	Property or bridge demolition accidents	Chapter 11: Socio-Economics and Health (Scoping) Chapter 12: Socio-Economics and Health (ES)	Y	C	Workers	The Proposed Development only involves the demolition of a single barn which is located approximately 30m away from Radwinter Road and members of the public. The demolition of this barn would be managed under the CDM Regulations and, therefore, further consideration is not required in the ES.	N
Technological or Manmade Hazards	Engineering accidents and failures	Tunnel failure/ fire	N/A	N	N/A	N/A	There are no tunnel structures proposed as part of the Proposed Development or within the Study Area.	N

Existing Baseline Conditions

- 15.16 The baseline relevant to this topic comprises:
- Features external to the Proposed Development that contribute a potential source of hazard to the Proposed Development;
 - Sensitive environmental receptors at risk of significant effect; and
 - Current (without the Proposed Development) major accident and disaster risks for the existing locality.
- 15.17 Major accident(s) and / or disaster(s) risks relevant to the baseline in the absence of the Proposed Development include extreme weather events and associated flooding. Baseline 'without Development' conditions are described in detail in the following Chapters: Chapter 7 (Air Quality), Chapter 8 (Ecology), Chapter 9 (Flood Risk and Drainage), Chapter 13 (Transport) and Chapter 14 (Climate Change).

Evolution of the Baseline Conditions without Development

- 15.18 The future baseline is not anticipated to differ significantly from the current baseline with regards to the vulnerability of the Proposed Development to the risk of major accident(s) and / or disaster(s).

Predicted Impacts

- 15.19 All MA&D event categories and types have been scoped out of further assessment (see **Table 15.3** above for justification).

Evaluation of Predicted Impacts

- 15.20 Typical methods employed within an EIA to define significance are not applicable to the description of MA&D. In the context of this chapter, MA&D are events which rarely occur due to the mitigation, management or regulatory controls implemented to prevent them. By definition, if a MA&D were to occur, the likely worst case would always be a major adverse effect.

Mitigation

- 15.21 Mitigation in each of the technical chapters (chapters 6 to 14) has been assumed will be implemented for the Proposed Development in order to assess the magnitude of impact for each option; these are reported and discussed in detail in the relevant technical chapters.

Residual Effects

- 15.22 There are no residual effects as all of the MA&D event categories and types have been scoped out from further assessment.

Cumulative Effects

Monitoring

- 15.23 No monitoring is required, as all MA&D event categories and types have been scoped out from further assessment.

Cumulative Effects

16

16.0 Cumulative Effects

Introduction

- 16.1 This chapter describes the scope of the cumulative effects in the locality of the Site as considered by this assessment. Each technical chapter of [this the original ES and, where appropriate, this Addendum](#) (chapters 6 to 153) includes a detailed assessment of the likely cumulative environmental effects, therefore, this chapter provides a summary of the cumulative assessment conclusions for each of the ES technical topics.

Methodology

- 16.2 There is no accepted methodology for cumulative assessment, although guidance is available in the form of EC (May 1999) Guidelines for the Assessment of Indirect and Cumulative Impacts.
- 16.3 There are two main forms of cumulative effect:
- Inter-project effects: The combined effect of the Proposed Development together with other reasonably foreseeable or committed developments (taking into consideration effects at both the construction and operational phases); and
 - Intra-project effects: The combined effects caused by the combination of a number of impacts on a particular receptor (taking into consideration impacts at both the construction and operational phases), which may collectively cause a more significant effect than individually. For example, the combination of noise and air quality impacts.

Inter-Project Effects

- 16.4 Inter-project cumulative effects relate to multiple proposed developments giving rise to significant effects at a receptor. For example, a number of developments in close proximity to one another may, for example, give rise to significant landscape and traffic effects cumulatively.
- 16.5 There is no guidance which defines the appropriate study area for considering cumulative effects of identified consented and pending developments. A set of screening criteria has, therefore, been developed to identify which cumulative schemes should be subject to assessment in combination with the Proposed Development.
- 16.6 Projects were considered for cumulative effects where they meet the following criteria:
- Development which is within a zone of influence of the Proposed Development. This zone has been set at 2 km;
 - Planning applications during the last two years;
 - Development which is expected to be constructed at the same time as the Proposed Development.
 - EIA development (which has the potential to have likely significant effects in its own right);
 - Development which introduces sensitive receptors in close proximity to the Site (acknowledging that the agent of change principle means the introducer of any sensitive receptors is responsible for assessing impacts on those receptors); and
 - Major Development.

- 16.7 Major Development is classified as development involving one or more of the following:
- The winning or working of minerals or the use of land for mineral-working deposits;
 - Waste development;
 - The provision of dwelling houses where the number of dwelling houses to be provided is 10 or more;
 - The development is to be carried out on-site having an area of 0.5 hectares or more; and
 - The provision of a building or buildings where the floor space to be created is 1,000 square metres or more.

Intra-Project Effects

- 16.8 There is no established EIA methodology for assessing and quantifying the combined effects of individual effects on sensitive receptors. It should, however, be noted that cumulative effects can generally only be broadly identified and assessed qualitatively and where possible, quantified. The assessment has been undertaken in accordance with the following stages:
- Identification of sensitive receptors;
 - A review of the residual effects reported in Chapters 6 to 153 to identify the potential for effect interactions and, therefore, combined cumulative effects; and
 - Identification of appropriate mitigation of the identified effects, as required.

- 16.9 The criteria for identifying those receptors that are considered to be potentially sensitive include the nature of the receptor, proximity to the works, and extent of exposure to impacts. It should also be noted that different stages of construction works will result in different effect magnitudes. It may be that for some environmental topics, there are no interactions with other individual effects and, therefore, there are no combined cumulative effects.

Results

Inter-Project Effects

- 16.10 Based on criteria set out earlier in this chapter and following a planning search across the UDC local authority area, the following projects were identified and are listed in **Table 16.1A**.

Table 16.1A: Development Commitments

PROJECT	PLANNING REFERENCE	KEY ELEMENTS OF PROPOSAL	REASONS FOR INCLUSION/ EXCLUSION BASED ON CRITERIA PROVIDED ABOVE
Land South of Radwinter Road	UTT/13/3467/OP UTT/16/1856/DFO	Up to 230 dwellings including link road and access to and preparation of land for one form entry primary school.	A Reserved Matters Application (RMA) for 200 dwellings was approved in January 2017. This project is directly adjacent to the Proposed Development and is currently under construction. Due to the proximity of the project to the Proposed Development, there may be cumulative impacts, therefore, this project has been included in the cumulative assessment.

PROJECT	PLANNING REFERENCE	KEY ELEMENTS OF PROPOSAL	REASONS FOR INCLUSION/ EXCLUSION BASED ON CRITERIA PROVIDED ABOVE
Land South of Radwinter Road (former Printpack Site)	UTT/20/2007/FUL	Demolition of existing buildings and erection of a discount food store, a 70-bed care home and 49 no. retirement living apartments with access, car parking, landscaping and associated works.	This project was submitted in August 2020 but has not yet been approved. The project is approximately 560m west of the Proposed Development. If this project is approved, there may be some overlap in timings of construction, therefore, this project has been included in the cumulative assessment.
Land North of Shire Hill Farm	UTT/17/2832/OP	Up to 100 dwellings.	This project was approved in July 2020 and is directly south west of the Proposed Development. There may be some overlap in the timing of construction works with this project and the Proposed Development, therefore, this project has been included in the cumulative assessment.
Land East of Thaxted Road	UTT/18/0824/OP UTT/19/2355/DFO	Up to 150 dwellings.	The RMA (19/2355/DFO) for this project was allowed on appeal on 29 January 2020. The project is approximately 590m south west of the Proposed Development. There may be some overlap in the timing of construction works with this project and the Proposed Development, therefore, this project has been included in the cumulative assessment.
Land at Ashdon Road	UTT/13/2423/OP	Redevelopment of the site for up to 167 residential units.	Although this project was consented on 26 November 2014, this scheme is only partially built out and ECC requested that the level of occupation in 2018 when the base traffic counts were undertaken is established. This project has, therefore, been included in the cumulative assessment.
Land East of Little Walden Road	UTT/16/2210/OP	Up to 85 residential dwellings.	This project was granted permission at appeal and is located approximately 1.9km north west of the Proposed Development. This project has been included in the cumulative assessment at the request of ECC.

- 16.11 Therefore, a total of six developments have been considered in the assessment of cumulative effects:
- Land South of Radwinter Road UTT/16/1856/DFO;
 - Land South of Radwinter Road UTT/20/2007/FUL;
 - Land North of Shire Hill Farm (UTT/17/2832/OP);
 - Land East of Thaxted Road (UTT/18/0824/OP & 19/2355/DFO);
 - Land at Ashdon Road UTT/13/2423/OP; and
 - Land East of Little Walden Road (UTT/16/2210/OP).

- 16.12 The projects mentioned above have been used to inform the cumulative assessment of each topic. The summaries of the cumulative assessment for each topic are detailed below.

Predicted Cumulative Effects – Inter-Project Effects

Agriculture

- 16.13 There are no assessed aspects of the Proposed Development which could result in cumulative effects on soils and agricultural land quality. There are no other projects which could result in cumulative effects upon this environmental aspect.

Air Quality

Construction Phase

- 16.14 Potential cumulative construction effects could occur should construction of other consented development occur at the same time as the Proposed Development and where receptors are within sufficient distance of each site to experience effects from both. The IAQM guidance indicates that significant effects can occur up to 350m from construction activities, therefore, cumulative effects would only occur where there are other construction sites within 700m of the Proposed Development with receptors in between.
- 16.15 The following schemes are within 700m of the Proposed Development and could be under construction at the same time:
- UTT/13/3467/OP and UTT/16/1856/DFO - Land South of Radwinter Road;
 - UTT/17/2832/OP - Land North of Shire Hill Farm; and
 - UTT/18/0824/OP and UTT/19/2355/DFO - Land East of Thaxted Road.
- 16.16 Significant cumulative effects are unlikely to occur as each development is anticipated to employ appropriate dust mitigation techniques such that the individual construction phase effect should be 'not significant', either alone or cumulatively. Furthermore, it is unlikely that construction traffic from the other committed developments would use the same construction traffic routes as specified for the Proposed Development. Therefore, cumulatively, the trip generation is unlikely to exceed the EPUK and IAQM assessment criteria and impacts are unlikely to be significant.

Operational Phase

- 16.17 The future baseline traffic flows include the committed trip generation associated with the following schemes:
- UTT/13/3467/OP;
 - UTT/16/1856/DFO;

- UTT/17/2832/OP; and
- UTT/18/0824/OP.

16.18 The modelling assessment has therefore taken account of traffic generated by approved developments in the vicinity of the Site. Concentrations of all three pollutants (NO₂, PM₁₀, PM_{2.5}) would remain below the relevant air quality objectives with both the approved developments and Proposed Development in operation, therefore, the assessment of cumulative effects is inherent to the assessment provided and cumulative impacts are considered to be negligible in terms of local air quality and, therefore, not significant.

Ecology

16.19 Cumulative impacts have been considered within the assessment of effects taking into consideration the potential cumulative impacts with schemes identified earlier in this chapter.

16.20 The Proposed Development has been designed to mitigate ecological impacts within the Site boundary and provide ecological enhancement including enhancing the habitat connectivity and quality with the adjacent landscape.

Flood Risk and Drainage

16.21 All surrounding developments are subject to the same guidance and legislation concerning flood risk. Therefore, all sites should provide appropriate built-in by design mitigation measures to ensure flood risk is not increased elsewhere; including surface water drainage attenuation volumes, water quality treatment and run-off rates that do not pose a flood risk to the Proposed Development Site or third party land. On this basis, there are not considered to be any adverse cumulative effects with regards to the Proposed Development in terms of flood risk or drainage.

Landscape and Visual

16.22 The following Proposed Developments were identified during the Scoping Stage for assessment of cumulative effects. Those highlighted in bold are now largely constructed and at least partially inhabited.

- **Land South of Radwinter Road UTT/16/1856/DFO and UTT/20/2007/FUL;**
- Land North of Shire Hill Farm (UTT/17/2832/OP);
- Land East of Thaxted Road (UTT/18/0824/OP & 19/2355/DFO);
- **Land at Ashdon Road UTT/13/2423/OP;** and
- Land East of Little Walden Road (UTT/16/2210/OP).

16.23 All of the above schemes have been granted planning permission and UTT/16/1856/DFO / UTT/20/2007/FUL and UTT/13/2423/OP are now largely completed and a feature of the local landscape character and visual context. These are, therefore, a current feature of the existing baseline and have been assessed as such.

16.24 In respect of landscape effects, having considered the remaining planning applications, it is not judged that they will result in any difference in the assessment in the context of this cumulative baseline scenario. The erosion of rural character and encroachment of built form to the east of Saffron Walden, has already been noted in the existing baseline. Applications UTT/18/0824/OP and UTT/17/2832/OP, both also east of Saffron Walden, may lead to a further erosion of the rural landscape character, but these applications are located outside of the area considered as the local landscape character and would not change the baseline local landscape character relevant to the Site.

- 16.25 With regard to visual effects, the cumulative baseline similarly has no change to the visual effects identified, with the exception of Group 2 (Viewpoint 3, **Appendix 10.3**). Receptors within Group 2 have the potential to experience distant views of built form associated with application UTT/17/2832/OP. However, these views will be experienced at a distance of around a kilometre, against a backdrop of existing adjacent development within Saffron Walden. At this distance, it is considered this change would have negligible impact on the view. As a result, the visual effects on this receptor would be negligible in a cumulative baseline scenario.

Noise and Vibration

- 16.26 The schemes identified are residential, or predominantly residential developments. Therefore, the key cumulative effects are likely to be related to off-site road traffic noise levels, and it is understood that traffic from the schemes has already been included in the supplied traffic data. For this reason, the consideration of cumulative effects is already embedded within the assessment undertaken, representing a worse-case scenario, resulting in a robust assessment.

Socio-Economics

- 16.27 As detailed in Chapter 12 of this Addendum, six consented and planned developments in a 2km radius of the Proposed Development have been considered in relation to possible cumulative effects. This includes 5 residential developments, providing approximately 732 residential units and a 70 bed care home and 49 retirement apartments.
- 16.28 The consented and planned residential developments would provide considerable benefit in terms of meeting the housing needs in the district and providing temporary employment during the construction phases. The 70 bed care home would also provide for some employment during the operational phase. Nevertheless, the combined developments would also result in additional pressure on existing public infrastructure such as educational and health facilities.
- 16.29 The cumulative developments combined with the Proposed Development would result in an increase in approximately 2,426 residents and approximately 276 primary school children and 183 secondary school children. Two of the cumulative developments (UTT/16/1856/DFO and UTT/17/2832/OP) include the provision of land for a primary school, while the other cumulative developments include for financial contributions towards education provision. The majority of the cumulative developments also include for financial contributions towards healthcare.
- 16.30 With the inclusion of land for primary school provision and financial contributions towards education and healthcare, no significant cumulative effects are predicted.

Transport

- 16.31 With regards to traffic flows, the assessment presented in Chapter 13 of the original ES includes traffic generated by these committed schemes, which are assumed to form part of the future baseline traffic flows for assessment purposes. As such, the effects of the development when considering committed developments has already be considered, and forms an integral part of the assessment findings, making for a robust assessment process.

Climate Change

- 16.32 Cumulative effects are considered relevant in climate change terms with regard to GHG emissions and impacts of changes in climate on the Proposed Development in consideration of the additional Proposed Developments in the area.

16.33 However, because climate change is a global issue, all developments taking place across the world results in net increases in GHG emissions and can be considered to operate cumulatively. Therefore, all developments identified by the EIA co-ordinator are considered as part of this assessment. Based on the above, the cumulative impacts are assumed to be the same as those already identified above and would result in a **slight** effect which is considered to be **significant**.

16.34 Construction of all the listed cumulative schemes would all produce GHG emissions, contributing to climate change. However, it is reasonable to conclude that construction of the project, in accumulation with all the other developments proposed in the locality, would in combination with the other projects, give rise to significant GHG emissions at those scales and therefore the cumulative effect can be assumed to be the same as that for the Proposed Development, resulting in a slight adverse effect.

Major Accidents & Disasters

16.35 No cumulative effects are anticipated, as all MA&D event categories and types have been scoped out from further assessment.

Predicted Cumulative Effects – Intra Project Effects

16.36 The receptors considered to be the most sensitive to the cumulative impacts are nearby residents including those at Turnip Hall Farm, Pearson Road, Sativus Close, Fairfax Drive, 1 Radwinter Road and The Vineyard.

16.37 A summary of the residual effects for each chapter is provided below:

Agriculture

16.38 Following the implementation of mitigation, there will be **minor adverse** residual effects on agricultural land resources and **negligible** residual effects on soil resources.

Air Quality

Construction Phase

16.39 Following implementation of the measures that will be incorporated into the site-specific CEMP, the residual effects will be **negligible** and, therefore, not significant.

Operational Phase

16.40 Following incorporation of the mitigation measures within the scheme design, residual effects will remain **negligible** and not significant.

Ecology

16.41 Assuming the embedded mitigation and mitigation measures are implemented, the Proposed Development will result in the following residual effects which are not considered to be significant under the EIA Regulations:

- A **minor positive (beneficial)** permanent effect on habitat biodiversity, hedgerow length and biodiversity and enhancement of standing water habitat;
- Potential for short-term **minor negative (adverse)** temporary impact to reptiles during construction, if present at the time of construction.
- Potential for a long-term **minor positive (beneficial)** permanent enhancement of reptile habitat on Site (if present);

- A **negative (adverse)**, permanent impact on farmland birds using arable crop habitats e.g. skylark;
- A **positive (beneficial)**, long-term permanent impact on generalist birds through increased provision of nesting and foraging habitat and increasing diversity of habitats through attenuation basins;
- Potential for short-term **minor negative (adverse)** temporary impact to hazel dormice during construction (if present);
- Potential for a long-term **minor positive (beneficial)** permanent enhancement of hazel dormice habitat (if present);
- A **negative (adverse)** impact on a low status bat roost within tree (T5);
- A small, **positive (beneficial)**, long-term impact on common bat species through increase provision of roost sites and enhancing foraging/commuting habitat;
- A **neutral (negligible)** impact on otter and water vole if found during construction;
- A small, **positive (beneficial)**, long-term impact on otters and water voles through increased foraging habitat available;
- A **positive (beneficial)** permanent impact on hedgehogs;
- Potential for permanent **negative (adverse)** impact to brown hare, if present at the time of works; and
- A **positive (beneficial)** permanent impact on terrestrial invertebrate assemblages.

Flood Risk and Drainage

- 16.42 With the identified mitigation including the sustainable drainage system, as outlined in the Drainage Strategy, the residual effects are deemed to be **negligible** with the exception of surface water quality which will have a **minor beneficial** residual effect.

Landscape and Visual

- 16.43 Following the implementation of the mitigation measures outlined in Chapter 10, visual receptors in Group 5 (users of Harcamlow Way), will experience **moderate adverse** (not significant) effects at the residual stage (15 years post completion). Residual effects on other visual receptors ranged from **minor adverse** to **negligible**.
- 16.44 With regards to landscape, the assessment of residual effects concluded that the Proposed Development will result in a **minor neutral** effect on landscape features and overall landscape pattern of the Site. The residual effect on the local landscape character was considered to be **minor adverse** and that the residual effect on the settlement identity of Swards End was **minor/negligible adverse**.

Noise and Vibration

- 16.45 Following the implementation of a CEMP, there will be **minor adverse** construction noise effects at Pearson Road, Sativus Close, Fairfax Drive, **major adverse** effects at Turnip Hall Farm and **negligible** effects at 1 Radwinter Road. However, when considering the average distance from receptors, construction noise was considered to be **negligible**. Noise, as a result of construction traffic was considered to be **negligible**.

16.46 In addition, considering the average distance from receptors, construction vibration was considered to be **negligible**.

16.47 Noise, as a result of operational traffic movements ranged from **negligible to minor adverse**.

Socio-Economics

16.48 The Socio-Economic Assessment concluded there will be **minor beneficial** residual effects as a result of construction employment, increase in economic growth, open space provision, crime reduction and safety and **moderate/minor** beneficial residual effects on housing provision. There will be **minor adverse** residual effects as a result of demand in education, population increase and demand on healthcare services.

Transport

16.49 Following the implementation of a CEMP, construction residual effects will be **minor adverse**. Once operational, all residual effects were also considered to be **minor adverse** with the exception of severance which was considered to be **negligible**.

Climate Change

16.50 The residual effects are unlikely to reduce with the additional mitigation in place as the exact percentage reduction in GHG cannot be calculated at this stage and therefore it cannot be assumed that the development will be carbon neutral at either construction or operation. Therefore, there is an intermediate residual effect which is significant in EIA terms. Nonetheless, as the development shows potential for net zero carbon with the inclusion of additional PV panels, it can be assumed that the potential effect may be reduced to a non-significant level as the detailed design progresses at reserved matters stage.

16.51 Climatic changes are not expected to impact on construction or operation of the Proposed Development and would range from negligible to minor adverse and therefore **not significant**.

Major Accidents & Disasters

16.52 There are no residual effects as all of the MA&D event categories and types have been scoped out from further assessment.

Cumulative Construction Effects

16.53 Construction will take place entirely within the Site. Due to the proximity of nearby residents and there will be some construction impacts, most notably being noise, dust and transport.

16.54 The Air Quality and Transport Assessments concluded that residual air quality and transport effects at the construction phase would not be significant.

16.55 The Noise Assessment concluded that there would be major adverse construction noise effects at Turnip Hall Farm which is considered to be significant. However, the Noise Assessment concluded that when construction works are undertaken at an average distance from off-site receptors, which should be the case for the majority of the time, no significant adverse effects are predicted. The distances from receptors at which construction noise levels would result in no residual significant adverse effects are 110m for 'Site preparation works', 100m for 'Foundations and Landscaping works', 130m for 'Building erection works', and 55m for 'Hardstanding/road construction works'.

- 16.56 Based on the considerations above, significant cumulative construction effects on sensitive receptors are not considered likely.

Cumulative Operational Effects

- 16.57 The receptors considered to be most sensitive to the cumulative impacts identified are nearby residents including at Turnip Hall Farm, Pearson Road, Sativus Close, Fairfax Drive, 1 Radwinter Road and The Vineyard. With the implementation of the mitigation measures proposed, these are not expected to be significant singularly, and consequently not expected to be significant cumulatively.

Conclusions

- 16.58 The combined effects of the different types of residual impacts from the Proposed Development have been considered, and it is concluded that there are no significant cumulative effects that are attributable to the development. This has included a consideration of the cumulative health effects on the relevant health receptors.
- 16.59 In summary, when taking into account the impacts of the Proposed Development in combination with all the other schemes, it is not considered that the cumulation of projects will significantly alter the assessment of the Proposed Development or its conclusions, or result in substantially greater impacts.
- 16.60 Where appropriate, the cumulative effects have been taken into account in individual assessments with both committed and reasonably foreseeable schemes either factored into the baseline modelling or accounted for as part of the assessment of overall impact (where appropriate). In this sense, the assessment of the likely significant cumulative effects of the Proposed Development constitutes a robust, worse case precautionary approach to the assessment.
- 16.61 The next chapter concludes the outcomes of the EIA process as reported within the ES.

Conclusions

17

17.0 Conclusions

Introduction

- 17.1 The planning application prepared to which this ES [Addendum](#) relates, seeks planning permission for the following Proposed Development on Land South of Radwinter Road (East of Griffin Place), Saffron Walden:
- Outline planning application for the erection of up to 233 residential dwellings including affordable housing, with public open space, landscaping and sustainable drainage system (SuDS) with vehicular access point from Radwinter Road. All matters reserved except for means of access.*
- 17.2 The EIA has assessed the likely significant environmental effects which are to arise from the Proposed Development, based upon the parameter plans and project information provided and detailed [within the original ES and this Addendum](#). ~~earlier in this ES~~.
- 17.3 The EIA Regulations consider that this scale of development constitutes a 'Schedule 2 Development' and, therefore, should at least be 'screened' for whether this project constitutes EIA development or not. In this instance, the Applicant has volunteered an EIA, to ensure a thorough assessment of the environmental effects of the project have been undertaken prior to, and to inform the Masterplan proposals, of the planning application.
- 17.4 In order to determine the scope of the EIA, a formal scoping request was submitted to UDC in March 2021, however, at the time of [submission in August 2021](#) ~~writing this ES~~, UDC ~~had have~~ not responded to this request, notwithstanding the five-week period as prescribed by the EIA Regulations have since passed, without an agreed extension of time. On this basis, the scope of the EIA was based as submitted, whilst also taking into account those statutory consultee responses which have been received in response to the scoping request. This determined that the following environmental topics should be included within the ES:
- Agriculture;
 - Air Quality;
 - Ecology;
 - Flood Risk and Drainage;
 - Landscape and Visual;
 - Noise;
 - Socio-Economics and Health; and
 - Transport.
- 17.5 Following submission of the planning application and the ES, UDC adopted their formal Scoping Opinion on the 16 September 2021 (planning reference: UTT/21/1138/SO) which raised a number of additional aspects UDC considered should be included within the ES. Paragraph 88 of the Scoping Opinion states that:
- In view of the reasoning given by consultees and legislation it is considered necessary that the following additional impacts are included and assessed within the ES:*
- Road traffic vibration (in the operational phase)
 - Ecology
 - Heritage Impacts (to be included within the LVIA)

- *Climate Change*

- *Major Accidents and Disasters*

17.6 An assessment of operational road traffic vibration, climate change and major accidents and disasters has been undertaken and is presented within this document. With regards to heritage impacts, following the issue of the Scoping Opinion, ECC Conservation Officer has since confirmed that they do not consider the proposals to result in harm to the significance of the designated heritage assets, and therefore raise no objection (see **Appendix 1.2A**), therefore, an assessment of heritage impacts has not been included in the LVIA as part of this Addendum. It should be noted that Ecology was previously volunteered to be scoped into the EIA by the Applicant, and therefore was included in the original ES.

17.7 The Addendum also includes the following:

- Further information on Air Quality - following submission, UDC had concerns that the link road between Radwinter Road and Thaxed Road being constructed under planning applications: UTT/13/3467/OP and UTT/17/2832/OP is not completed and the Proposed Development may result in additional air quality impacts within Saffron Walden. To address these concerns, additional detailed air quality modelling has been carried out to assess the impact of the Proposed Development assuming 'no link road' scenario;
- Additional ecological survey data that was not available at the time of submission of the Original ES; and
- An updated Socio-Economics Assessment to include alterations to the indicative housing mix, as supported by the Council's Housing Officer.

17.8 Each chapter sets out the baseline information for the environmental topic, assesses the potential impacts, recommends mitigation measures (if required) and makes a judgement on the significance of the impact, both at the construction phase and the operational phase of the Proposed Development. Each chapter concludes by summarising the results of the assessment in a summary of impacts table. The concluding remarks of each assessment chapter are as detailed below. For clarity, in the sections below, any changes to the assessment conclusions arising from the EIA work summarised in this Addendum are coloured blue. The remainder of the text is as per the Environmental Statement dated August 2021.

Agriculture

17.9 The Site comprises principally of two agricultural fields which includes 3.8ha of grade 2 quality agricultural land and 13.1ha of subgrade 3a land.

17.10 There are two main soil types which are present on the Site. These are:

- Calcareous clays and heavy clay loams over chalk with permeable subsoil of variable depth; and
- Deep clays in the south and east comprising calcareous clay topsoil over slowly permeable clay subsoil.

17.11 With regards to the loss of agricultural land as a result of the Proposed Development, this was considered to be a minor adverse effect. As there is no mitigation possible for the loss of this land to built development, the residual effect of this loss of land remains at minor adverse.

17.12 Mitigation for potential loss or damage to soil resources is available in the form of a site specific Soil Management Plan (in accordance with the Construction Code of Practice for the Sustainable Use of Soils on Construction Sites). This should include:

- Depth and method of topsoil stripping and stockpiling;
- Identification of landscaping topsoil requirements and assessment of suitability and availability of on-site resources; and
- Means of subsoil protection from compaction damage (specific pathways and restricted areas for construction traffic) and remedial measures (such as ripping/subsoiling) to remove damage.

17.13 With this in place, potential residual effects on soil resources was considered to be negligible.

Air Quality

17.14 The air quality impacts associated with the Proposed Development has been assessed in Chapter 7.

17.15 The Site itself is not located within an AQMA but is located 800m to the east of an AQMA within Saffron Walden which is centred on Elm Grove.

17.16 On the basis that there will be a site-specific CEMP which will incorporate measures to reduce dust and traffic emissions, emissions as a result of construction activities will be adequately mitigated and impacts were considered to be negligible and not significant.

17.17 The ADMS dispersion model has been used to predict the impact of the operational development on local NO₂, PM₁₀ and PM_{2.5} concentrations under both the 'with link road' and 'no link road' scenarios. The assessment has used conservative assumptions to predict impacts. The assessment has predicted a negligible impact on concentrations of all three pollutants as a result of operational traffic. The impact of the proposals on existing receptors would, therefore, not be significant.

17.18 The assessment has predicted NO₂, PM₁₀ and PM_{2.5} concentrations 'well below' the relevant objective limits at all proposed receptors. The impact of the Proposed Development in relation to new exposure would, therefore, not be significant.

Ecology

17.19 Overall, the Proposed Development with embedded and additional mitigation will have very few residual effects and none anticipated to be significant under the EIA Regulations. The effects that do remain are discussed for both the construction and operational phases of the Proposed Development in **Table 17.1A**.

Table 17.1A Summary of Identified Ecological Impacts

ECOLOGICAL FEATURE	POTENTIAL IMPACT	EMBEDDED AND ADDITIONAL MITIGATION	RESIDUAL IMPACT
Pounce Wood LWS	Sediment Input/Pollution from construction activities. Negative, temporary and significant at Site level.	Stringent Pollution Controls. Production and Implementation of CEMP.	Negligible. Not significant under EIA Regulations.
Arable and arable field margins	Permanent loss of habitat. Significant at Site level.	None.	Permanent loss of habitat. Significant at Site level.

ECOLOGICAL FEATURE	POTENTIAL IMPACT	EMBEDDED AND ADDITIONAL MITIGATION	RESIDUAL IMPACT
Semi-improved neutral grassland	Loss during construction. Potential for negative permanent impact if appropriate species mix not selected. Significant at Site level.	Each reserved matters application to be accompanied by a LEMP setting out how measurable biodiversity enhancement will be achieved through an appropriate native species mix.	Positive, permanent at a Site level. Not significant under EIA Regulations.
Hedgerows	Land take of species-rich hedgerow for access. Embedded mitigation includes provision for net hedgerow enhancement. Potential for negative impact at Site level if appropriate species mix not selected and hedgerows not safeguarded during construction.	Enforcement of adequate RPAs in line with BS 5837:2012 Trees in Relation to Design, Demolition and Construction. Replacement hedgerow planting to ensure native species rich mix as detailed within a LEMP agreed at the reserved matters stage.	Positive permanent at a Site level. Not significant under EIA Regulations.
Watercourses	Net enhancement of standing water habitat through SuDS scheme. Positive, permanent at the Site level. Potential for construction impacts (direct/indirect) through pollution/incursions negative and temporary at a Site level.	Each reserved matters application to be accompanied by a LEMP setting out how the water features within the final SuDS design will use native species mix to enhance this habitat over the long term. Existing watercourse safeguarded during construction through CEMP.	Positive, permanent at a Site level. Not significant under EIA Regulations. Negligible. Not significant under the EIA Regulations.
Reptiles	Potential killing and injuring of individual reptiles during construction if present. Negative permanent at up to a Local level predicted (low confidence). Creation of attenuation ponds, species rich grassland, native shrub, tree planting and wetland grass areas for benefit of reptiles. Positive permanent at the Site level.	The CEMP to include a RAMS Method Statement when construction details are known to minimise impacts during construction to reptiles, should they be present at the time of works. The LEMP to set out measures to enhance the Site for reptiles over the long term including locations of reptile hibernacula, log piles etc.	Negative, temporary at a Site level. Not significant under EIA Regulations. Positive, permanent at a Local level. Not significant under EIA Regulations.

ECOLOGICAL FEATURE	POTENTIAL IMPACT	EMBEDDED AND ADDITIONAL MITIGATION	RESIDUAL IMPACT
Birds	<p>Loss of habitats including arable fields, field margins which could affect bird species dependent on these habitats e.g. skylark. Negative and permanent at the Site level. Low confidence.</p> <p>Risk of killing or injuring nesting birds during demolition/vegetation clearance without mitigation. Negative and permanent at Local level.</p> <p>Creation of new scrub and tree and standing water features for benefit range of urban and farmland bird species. Permanent positive and significant at Local level.</p>	<p>Creation of habitats to benefit wide skylark foraging insects through increasing invertebrate diversity (attenuations ponds/native planting).</p> <p>Vegetation removal/building demolition will be undertaken outside of the bird breeding season (March - August inclusive) or under ecological supervision.</p> <p>LEMP to set out detailed landscape planting for benefit of urban and farmland birds including details of nest boxes.</p>	<p>Negative and permanent to arable dependent species at the Site level. Not significant under EIA Regulations.</p> <p>Negligible. Not significant under EIA Regulations.</p> <p>Positive permanent significant at a Local level. Not significant under EIA Regulations.</p>
Bats	<p>Demolition of bat roosts if present at the time of building demolition (low likelihood). Negative and permanent at Site level.</p> <p>Removal of hedgerow affecting roost in T5. Negative, permanent and significant at the Local level. Confidence low.</p>	<p>CEMP to include precautionary method statement should a bat be suspected or found during demolition works should cease and a bat ecologist contacted.</p> <p>If T5 is to be affected, a pre-commencement updated Further nocturnal survey of confirmed roosting sites during in the peak maternity period (June and July) to inform mitigation may be required to inform an appropriate licence and should be secured via planning condition. Destruction of roosts under EPSL granted by Natural England or a site registration under the Bat Low Impact Class Licence (LICL) with accompanying bat mitigation plan which will include details of replacement roosting provision and secured via planning condition if needed.</p>	<p>Negligible. Not significant under EIA Regulations.</p> <p>Positive. Permanent at Site level. Not significant under EIA Regulations. Confidence low.</p>

ECOLOGICAL FEATURE	POTENTIAL IMPACT	EMBEDDED AND ADDITIONAL MITIGATION	RESIDUAL IMPACT
Bats	<p>Creation of attenuation ponds and new planting, strengthening of boundary planting for foraging/ commuting bats. Positive, permanent at Local level.</p> <p>Construction lighting causing disturbance to foraging and commuting bats. New introduced lighting of previously unlit foraging corridors as a result of the Proposed Development. Negative, temporary and permanent up to a Local level.</p>	<p>Biodiversity enhancements including the provision of bat boxes on retained standard trees enhance roosting habitats for roosting bats.</p> <p>Implementation of a LEMP to ensure that bat foraging and commuting habitat is maintained and enhanced.</p> <p>Construction works will be restricted to hours of 07:30 to 17:00 Monday to Friday and 08:00-13:00 on Saturday. Impacts limited to areas subject to overnight security lighting. Detailed lighting design and specification, to be prepared at the detailed design stage should be bat friendly and developed with the input of a bat ecologist.</p>	<p>Positive. Permanent at Local level. Not significant under EIA Regulations.</p> <p>Negligible. Not significant under EIA Regulations. Confidence low.</p>
Badgers	See confidential badger Appendix (Appendix 8.4)		
Hazel Dormice	Based on data gathered no impacts are predicted	New hedgerows will maintain connectivity and provide suitable habitat over the long term for hazel dormice should they become resident in the area.	Positive and permanent and significant at a Local level if dormice if become present. Not Significant under EIA Regulations.
Hazel dormice	<p>Risk of killing or injuring hazel dormice if present during vegetation clearance without mitigation. Negative and permanent at Local level.</p> <p>Loss of sections of hedgerow and connectivity for hazel dormice (if present) to create access. Negative and permanent at Local level.</p>	<p>Complete surveys and, if required, no vegetation clearance until a EPSL has been obtained from Natural England or other appropriate mitigation put in place.</p> <p>Complete surveys. The LEMP (and if needed EPS mitigation strategy) to set out how new hedgerows will maintain connectivity for hazel dormice and hedgerow species selection and planting density for their benefit.</p>	<p>Negligible. Not significant under EIA Regulations. Confidence low.</p> <p>Negligible. Not significant under EIA Regulations. Confidence low.</p>

ECOLOGICAL FEATURE	POTENTIAL IMPACT	EMBEDDED AND ADDITIONAL MITIGATION	RESIDUAL IMPACT
Hazel dormice	Creation of new scrub and hedgerows embedded in layout assumes not for benefit of hazel dormice.	Complete surveys. The LEMP (and if needed EPS mitigation strategy) to set out how new hedgerows will maintain connectivity for hazel dormice and hedgerow species selection and planting density for their benefit.	Positive and permanent and significant at a Local level if dormice are present. Not significant under EIA Regulations. Confidence low.
	Risk of predation from cats introduced from residents of new scheme (if present). Negative and permanent up to a Local level.	Complete surveys. The LEMP (and if needed EPS mitigation strategy) to set out how new hedgerows will maintain, be supplementary planted with appropriate species mix and density to minimise predation.	Negligible. Not significant under EIA Regulations. Confidence low.
Otters and water voles	Risk of injury during construction due to use of heavy machinery in proximity to watercourse. Negative temporary and Site level.	Pre-commencement riparian mammal survey and, if present, appropriate mitigation implemented prior to works commencing. Excavations will be covered overnight or left with a plank of wood or similar to ensure that otters do not become trapped. Furthermore, all chemicals will be stored securely as set out in a CEMP.	Negligible. Not significant under EIA Regulations.
	Enhancement of habitat for otters and water voles through attenuation basins if become present. Positive permanent at Site level.	Each reserved matters application to be accompanied by a LEMP setting out how standing water could benefit these species if applicable at that stage.	Potential positive permanent at Site level. Confidence low. Not significant under EIA Regulations.
Hedgehogs, brown hare and terrestrial invertebrates	Risk of injury to hedgehog and brown hare during construction. Negative at the Site level.	CEMP to include measures to safeguard hedgehogs and brown hare during construction.	Negligible. Not significant under EIA Regulations.
	Permanent loss of habitat potentially used by brown hare. Negative and permanent at Site level (if present).	N/A	If present permanent, negative at Site level.
	Enhancement of habitats for hedgehogs and invertebrates and connectivity through landscape planting and creation of attenuation ponds. Positive. Permanent at Site level.	LEMP to set out how barrier treatment to fences maintain habitat connectivity and planting benefit hedgehogs. Selection of planting for benefit of invertebrates and installation of bug boxes.	Positive. Permanent at Site level. Not significant under EIA Regulations.

- 17.20 The construction of a new residential development will place additional foul drainage capacity loading on the public foul sewer network. Any impact on the foul sewer network will need to be addressed in consultation with Anglian Water under a Section 106 Agreement.
- 17.21 It is proposed that surface water runoff is limited to the annual average greenfield runoff rate. This approach seeks to mimic the Site's natural drainage regime, which will minimise the impact on the wider catchment. Water will be attenuated at the Site prior to discharge using sustainable urban drainage systems, with storage provided up to the 1 in 100 year plus climate change event. Limiting runoff from the Site, and accommodating it on-site up to the aforementioned event, provides betterment over the current drainage regime.
- 17.22 Runoff from highways and parking areas will be treated prior to discharge. It is proposed that two levels of treatment area provided in the form of source control techniques, including permeable paving, swales and attenuation basins.
- 17.23 With the proposed Drainage Strategy in place, there will be a minor beneficial effect by reducing runoff to the surrounding area and providing water quality improvements. All other residual effects during the operational phase were considered to be negligible.

Landscape and Visual

- 17.24 A Landscape and Visual Impact Assessment has been undertaken to assess the likely significant effects of the Proposed Development on landscape and visual receptors.
- 17.25 The following landscape and visual receptors were scoped into the assessment:

Landscape

- Landscape elements and resultant landscape patterns;
- Local Landscape Character; and
- Cumulative effects on Local Landscape Character.

Visual

- Group 1: Views from Radwinter Road, north-west and north-east of the Site;
- Group 2: Views from PRow network north of Radwinter Road;
- Group 5: Views from the Harcamlow Way, north west of the Site; and
- Cumulative effects on visual receptors represented by Groups 1, 2 and 5.

- 17.26 A variety of primary mitigation has been proposed for inclusion in the Proposed Development which will minimise impacts on the existing landscape elements and resultant landscape patterns and will introduce new landscape features to the Site. Such mitigation includes:
- Woodland blocks on or around ridgelines for screening and views;
 - Landscape and green infrastructure has been central to the design and will represent 55% of the Site;
 - Green corridors to link public open space on high ground to the south east with public open space in the retained fields on the northern Site boundary;
 - Eastern parcel will be well integrated into the landscape to provide a sensitive transition to rural areas; and
 - SuDS features will mark the entrance making reference to historic and local landscape features, such as moats.

- 17.27 With regard to landscape receptors, during the construction phase, the introduction of uncharacteristic materials, machinery and levels of movement would result in a moderate-major adverse effect on landscape elements of the Site and the resultant landscape patterns. The construction activity and further erosion of the existing local landscape character would result in a moderate adverse effect on local landscape character and a minor adverse effect on the settlement identity of Swards End. However, due to design measures incorporated into the Proposed Development, and the retention of the majority of tree belts within the Site, once the Proposed Development is constructed and mitigation has matured (after 15 years), it is concluded that the Proposed Development will result in a minor neutral effect on landscape features and overall landscape pattern of the Site. The residual effect on the local landscape character was considered to be minor adverse and that the residual effect on the settlement identity of Swards End was minor/negligible adverse.
- 17.28 With regard to visual receptors, the assessment has identified that due to the localised topography patterns and patterns of vegetation, the Site has a very constrained visual envelope. Close range views of the Site will be limited to those along Radwinter Road (Group 1). During the construction phase, receptors of this view will experience views of the proposed access road construction for a short stretch (experienced as an altered view for approximately 200m, although the length of vegetation removed is approximately 130m). The removal of vegetation to facilitate the access will allow for glimpsed and partial views of construction of the wider Site. This will result in a minor adverse effect to receptors within Group 1 during construction. Once the road is complete, and the mitigation planting within the Site has matured, it is judged that this effect will not be significant
- 17.29 The local undulations in topography restrict views of the Site and of the Proposed Development. However, two locations have been identified where the elevated topography allows for panoramic views across to the Site. These are from the PRow network north of Radwinter Road (Group 2) and from Harcamlow Way, north-west of the Site (Group 5). In both instances, elevated and panoramic views to the eastern edge of Saffron Walden are possible and the Site is visible as two arable fields at the junction between the wider rural setting and the settlement edge of Saffron Walden. During the construction phase, uncharacteristic materials and levels of activity and movement will be visible on the Site, in the background of the view. It will be viewed alongside the Linden Homes development, and viewed as an extension of residential development into the countryside surrounding Saffron Walden. During the construction phase, this will result in a moderate-major (significant) effect on receptors of Group 5 and a moderate effect on receptors within Group 2. For Group 2, as a result of the mitigation designed into the Proposed Development, once construction is complete and the mitigation planting has matured, the overall effect will have reduced to minor adverse. Due to its elevation and the low incidence of intervening vegetation to screen views, Group 5 receptors will, however, continue to experience moderate effects (not significant), as a result of views experienced of residential development extending into the elevated, rural landscape.

Noise

- 17.30 The noise climate at the Site is influenced by road traffic noise, primarily from Radwinter Road, which borders the Site to the north and the existing noise levels at the Site have been established by direct measurement.
- 17.31 The construction phase of the Proposed Development has been considered to determine whether construction noise and vibration is likely to lead to significant effects at the noise and vibration sensitive receptors close to the Site. The following conclusions have been reached:

- Construction noise may lead to significant adverse effects at noise-sensitive receptors without mitigation measures when works are undertaken on the boundaries of the Site closest to the receptors. However, these significant effects would only occur for a short duration and for the majority of the time, no significant effects would occur;
- Construction vibration may lead to significant adverse effects at noise-sensitive receptors without mitigation measures when works are undertaken on the boundaries of the Site closest to the receptors. However, these significant effects would only occur for a short duration and for the majority of the time, no significant effects would occur; and
- The effect of construction traffic on off-site road traffic noise levels will not be significant.

17.32 The operational phase of the Proposed Development has been considered to determine whether operational road traffic noise and vibration is likely to lead to significant effects at the noise-sensitive receptors close to the Site. No significant effects are likely.

17.33 A range of best practice mitigation measures has been suggested to reduce noise and vibration levels from construction, tried and tested measures whereby their effectiveness can be relied upon and controlled through suitably worded planning conditions. However, even with these measures in place, significant adverse effects could still occur at noise-sensitive receptors when works are undertaken on the boundaries of the Site closest to the receptors. However, these significant effects would only occur for a short duration and for the majority of the time, no significant effects would occur, even without taking into account mitigation. Given the nature of the effect, there would be no long-term residual effects of significance.

Socio-Economics and Health

17.34 During the construction period, the Proposed Development is likely to generate 148 jobs, therefore, resulting in a minor beneficial residual effect.

17.35 Once complete and occupied, the Proposed Development will result in an increase of approximately 58404 people to the area which will put demand on local services and will, therefore, have a minor adverse residual effect.

17.36 The Uttlesford District Council Housing Delivery Test and 5-Year Land Supply Statement (Uttlesford District Council, 2021) identifies a housing requirement of 706 dwellings per year. Based on the Proposed Development delivering 40 units a year, this would equate to approximately 5.7% of the annual target of 706 dwellings a year. The Proposed Development would make a valuable contribution to the housing supply in the district. In particular, the Proposed Development's provision of affordable housing would increase the quantity of affordable housing which would help to address the accommodation needs of residents not able to afford the house prices within the district. The effects of the Proposed Development on housing provision would be of moderate / minor beneficial significance.

17.37 It is estimated that, on completion, total annual household expenditure would be £7.3 million. The Proposed Development is also estimated to house approximately 415 356 new working age (16 to 745 year olds) people, which is approximately 0.87% of the employed people in the district. This increase in local spending and introduction of new employees to the area was considered to have a minor beneficial residual effect.

17.38 The Proposed Development would create the need for approximately:

- 10 additional early years and childcare provision;
- 64 56 additional primary school;

- 42 ~~37~~ additional secondary school places; and
 - 9 ~~8~~ post 16 years old education.
- 17.39 Land for provision of a new primary school has been included in the housing development schemes (UTT/16/1856/DFO and UTT/17/2832/OP) located just to the west of the Site.
- 17.40 The Essex School Organisation Service's 10 year plan suggests that there would be capacity in secondary schools and primary schools over the next ten years, although a new primary school may be required to meet the demand from new housing. The demand on educational facilities in the local area was considered to have a minor adverse residual effect.
- 17.41 The Proposed Development would result in approximately 584~~04~~ new residents, which is an increase of approximately 0.2% of the population within the West Essex CCG and an increase of 2.54% of the registered patients at GP surgeries within 5km of the Site. This increase in demand on healthcare facilities in the local area was considered to have a minor adverse residual effect.
- 17.42 The Proposed Development includes new Green Infrastructure and recreational facilities for the existing and new communities. In addition, the Masterplan includes for approximately 10ha of public open space, which accounts for approximately 55% of the Site. The provision for open space is considered a minor beneficial residual effect.
- 17.43 The Masterplan for the Proposed Development has been designed to minimise the potential for crimes to occur, which was considered a minor beneficial residual effect.
- 17.44 With regards to health, The HUDU Rapid HIA checklist has considered the potential health impacts as a result of the Proposed Development across eleven key topic areas. Across the eleven topics of focus, none of the relevant health considerations are expected to see a negative impact. A large number of the points considered have minor positive or neutral benefits for existing and new residents in areas such as housing design and inclusivity, and access to open space.

Transport

- 17.45 The TA has identified and assessed the impacts of the Proposed Development in relation to the likely significant effects it would have on:
- Severance;
 - Driver delay;
 - Pedestrian delay and amenity;
 - Accidents and safety;
 - Hazardous loads; and
 - Fear and intimidation.
- 17.46 In assessing the above impacts, the assessment has considered the following matters:
- 2023 Baseline Year;
 - Assessment year (2026) baseline conditions (including committed development);
 - Proposed Development construction; and
 - Proposed Development with associated highway improvements (2026).

- 17.47 The assessment concludes that following the implementation of a CEMP, including restrictions on vehicle routing and working times, it is considered that these management strategies will minimise the potential effects associated with construction activity. Therefore, for severance, pedestrian delay, amenity, accidents and safety and fear and intimidation, it is considered that there would be a temporary (short-term) minor adverse impact as a result of the CEMP within the vicinity of the Site associated with ongoing construction activity. For driver delay, it is considered that there will continue to be a temporary (short-term) minor adverse impact.
- 17.48 As well as the inherent mitigation included as part of the design of the Proposed Development, the following mitigation measures have been included in the Proposed Development to mitigate any potential operational transport impacts. These include:
- Improvements at the Radwinter Road / Thaxted Road / East Street / Chaters Hill junction to provide a short right turn lane on Radwinter Road;
 - Upgrading of the existing mini-roundabout at the junction of Thaxted Road / Peaslands Road to provide a traffic signal controlled junction;
 - Upgrading of the existing priority controlled junction of High Street / Church Street to provide a traffic signal controlled junction; and
 - Travel Plan.
- 17.49 Following the implementation of the mitigation mentioned above, there will be minor adverse operational residual effects with the exception of severance which was considered to be negligible. Therefore, in line with the NPPF, the application should not be refused on transport grounds as the impact is not singularly or cumulatively severe.

Climate Change

- 17.50 Greenhouse gas emissions would be generated during construction of the development through the use of fuel in transportation and the embodied carbon within the materials used. These emissions will be short term and minimally contribute to climate change, and will be mitigated through the implementation of good construction practices via a CEMP. During operation, the use of electricity and increase in vehicle use for commuting purposes would generate greenhouse gas emissions.
- 17.51 In respect to climatic changes, the Proposed Development may be vulnerable to predicted changes in climate such as increased temperature and rainfall and more extreme weather events. The temporary nature of the construction phase would result in minimal disruption however when the development is in operation, increased precipitation could lead to flooding of surfaces and increased erosion of planting and landscaped areas. Increased temperatures could result in increased heat within the buildings and could impact on the physical structure and materials of the buildings.
- 17.52 To minimise effects in respect to both, greenhouse gas emissions from the Proposed Development and potential effects in respect to climatic changes, the development design stage incorporates measures to reduce energy demand and consequently the greenhouse gas emissions and improve its durability against climatic changes. These include but are not limited to:
- Compliance with the latest Building Regulations;
 - Provision of well insulated and energy efficient with energy efficient lighting and double glazed windows;

- Provision of sustainable drainage;
- Provision of open space and landscaping; and,
- Inclusion of water resource management practices.

Major Accidents & Disasters

- 17.53 There are no residual effects as all of the MA&D event categories and types have been scoped out from further assessment.

Summary of Mitigation Measures and Residual Effects

- 17.54 **Table 17.2A** provides a summary of the mitigation measures proposed, as a result of the assessment process for each of the environmental aspects considered, which have been demonstrated through this ES and can be implemented either through planning conditions or legal agreement.
- 17.55 The residual impacts are those effects that remain post-mitigation. Each of the technical chapters contained within this ES contains a detailed assessment of the residual impacts in respect of both the construction and operational phases of the Proposed Development.
- 17.56 The design proposals have evolved with, and been informed by the EIA process, in order to minimise any identified environmental effects as the design has progressed. However, where this has not been possible to fully resolve through the design, within each technical chapter, a range of measures have been incorporated into the scheme to help mitigate potential negative effects.
- 17.57 A summary of the residual impacts (i.e those impacts remaining after mitigation) for the Proposed Development are also contained within **Table 17.2A**.

Table 17.2A: Summary of Mitigation and Residual Effects

ENVIRONMENTAL ASPECT	DESCRIPTION OF EFFECT	SIGNIFICANCE	MITIGATION MEASURES PROPOSED	MECHANISM OF CONTROL/DELIVERY	RESIDUAL EFFECT
Agriculture	Loss of grade 2 agricultural land	Minor Adverse	N/A	N/A	Minor Adverse
	Loss of subgrade 3a agricultural land	Minor Adverse	N/A	N/A	Minor Adverse
	Loss or damage to soil	Moderate Adverse	Site-specific Soils Management Plan	Planning Condition	Negligible
Air Quality	Loss of 13.1ha of tenanted land with 1 year on contract	Minor Adverse	Phased development allowing use of land up to termination of contract/completion of construction which can be outlined in a CEMP	Planning Condition	Minor Adverse
	Impact of Construction Dust and PM ₁₀	Moderate Adverse	CEMP	Planning Condition	Negligible
	Impact of Operational Traffic NO ₂ , PM ₁₀ and PM _{2.5}	Negligible	Implementation of a Travel Plan	Planning Condition/Legal Agreement	Negligible
Ecology	New Exposure NO ₂ , PM ₁₀ , PM _{2.5}	Negligible	N/A	N/A	Negligible
	Sediment/pollution to Pounce LWS during the construction phase	Moderate/Minor Adverse (Site Level)	CEMP	Planning Condition	Negligible (Site Level)
	Arable and arable field margins - Permanent loss of habitat	Major/Moderate Adverse (Site Level)	None	N/A	Major/Moderate Adverse (Site Level)
	Semi-improved neutral grassland - loss during construction	Moderate Adverse (Site Level)	LEMP at reserved matters stage to set out how measurable biodiversity enhancement will be achieved through an appropriate native species mix	Planning Condition	Minor Beneficial (Site Level)

ENVIRONMENTAL ASPECT	DESCRIPTION OF EFFECT	SIGNIFICANCE	MITIGATION MEASURES PROPOSED	MECHANISM OF CONTROL/DELIVERY	RESIDUAL EFFECT
Ecology	Hedgerows - Landtake and removal of species-rich hedgerow to facilitate site access	Moderate/Minor Adverse (Site Level)	Embedded mitigation includes provision for net hedgerow enhancement Enforcement of adequate Root Protection Areas (RPAs) in line with BS 5837:2012 Trees in Relation to Design, Demolition and Construction Replacement hedgerow planting to ensure native species rich mix as detailed within a LEMP agreed at the reserved matters stage	Design as proposed Planning Condition Planning Condition	Minor Beneficial (Site Level)
	Watercourses - impact on watercourses during construction	Minor Adverse	Existing watercourse safeguarded through CEMP	Planning Condition	Negligible
	Watercourses - Net enhancement of standing water habitat through SuDS scheme	Negligible	LEMP at reserved matters stage setting out how the water features within the final SuDS design will use native species mix to enhance this habitat over the long term	Planning Condition	Minor Beneficial (Site Level)
	Reptiles - Impact to reptiles during construction	Moderate Adverse (Local Level)	Reasonable Avoidance Method Statement (RAMS) included within CEMP	Planning Condition	Minor Adverse (Site Level)
	Reptiles - Enhancement of reptile habitat	Minor Beneficial (Site Level)	LEMP at reserved matters stage to set out measures to enhance habitat on-site for reptiles	Planning Condition	Minor Beneficial (Local Level)
	Birds - Impact on farmland birds through loss or arable crop habitat	Moderate Adverse (Local Level)	Creation of habitats to benefit wider skylark foraging insects through increasing invertebrate diversity (attenuations ponds/native planting)	Design as proposed	Minor Adverse, (Site Level)
	Birds - Impact on nesting birds during construction	Moderate Adverse (Local Level)	Vegetation removal and any demolition will be undertaken outside of the bird breeding season (March - August inclusive) or under ecological supervision as specified in the CEMP	Planning Condition	Negligible
	Birds - Impact on generalist birds through increased provision of nesting and foraging habitat	Negligible/Minor Beneficial (Local Level)	LEMP to set out detailed landscape planting for benefit of urban and farmland birds including details of nest boxes	Planning Condition	Minor Beneficial (Local Level)

ENVIRONMENTAL ASPECT	DESCRIPTION OF EFFECT	SIGNIFICANCE	MITIGATION MEASURES PROPOSED	MECHANISM OF CONTROL/DELIVERY	RESIDUAL EFFECT
Ecology	Bats - Impact on bat roosts during construction, including disturbance of construction lighting on foraging and commuting bats	Moderate/Minor Adverse (Site Level)	CEMP to include construction lighting mitigations, and precautionary method statement should a bat be suspected or found during demolition works (low likelihood) should cease and a bat ecologist contacted	Planning Condition	Negligible
	Bats - Removal of hedgerow affecting bat roost in T5	Moderate/Minor Adverse (Local Level)	Further nocturnal survey confirmed roosting sites during peak maternity period (June and July) to inform mitigation. If T5 is to be affected, a pre-commencement updated nocturnal survey in the peak maternity period (June and July) may be required to inform an appropriate licence. Destruction of roosts under European Protected Species (EPS) licence granted by Natural England or a site registration under the Bat Low Impact Class Licence (LICL) with accompanying bat mitigation plan which will include details of replacement roosting provision	Planning Condition(s)	Minor Beneficial (Site Level)
	Bats - Creation of attenuation ponds and new planting, strengthening of boundary planting for foraging/commuting bats	Negligible/Minor Beneficial (Local Level)	Biodiversity enhancements including the provision of bat boxes on retained standard trees enhance roosting habitats for roosting bats	Planning Condition	Minor Beneficial (Local Level)
	Hazel Dormice - Impacts to hazel dormice during construction	Minor Adverse (Local Level)	LEMP at reserved matters stage to include detail on enhancing habitat for foraging and commuting bats	Planning Condition	Negligible
	Hazel Dormice - Enhancement of hazel dormice habitat embedded in layout	Negligible/Minor Beneficial	GEMP and if required EPS Licence from Natural England The LEMP at reserved matters stage to set out how new hedgerows will maintain connectivity for hazel dormice and hedgerow species selection and planting density for their benefit	Planning Condition	Minor Beneficial (Local Level)

ENVIRONMENTAL ASPECT	DESCRIPTION OF EFFECT	SIGNIFICANCE	MITIGATION MEASURES PROPOSED	MECHANISM OF CONTROL/DELIVERY	RESIDUAL EFFECT
Ecology	Hazel Dormice - Risk of predation from cats introduced from residents of the Proposed Development	Minor Adverse (Local Level)	Complete surveys. The LEMP (and, if needed, EPS mitigation strategy) to set out how new hedgerows will be maintained and be supplementary planted with appropriate species mix and density to minimise predation	Planning Condition	Negligible
	Otters & Water Voles - Impact on otters and water vole during construction	Minor Adverse (Site Level)	Pre-commencement riparian mammal survey and, if present, appropriate mitigation implemented prior to works commencing. Excavations will be covered overnight or left with a plank of wood or similar to ensure that otters do not become trapped. Furthermore, all chemicals will be stored securely as set out in a CEMP	Planning Condition	Negligible
	Otters & Water Voles - Impact on otters and water vole through enhancement of habitat	Negligible/Minor Beneficial (Site Level)	LEMP at reserved matters stage to include detail on enhancing the habitat on-site for otter and water vole	Planning Condition	Minor Beneficial (Site Level)
	Impacts on brown hare and hedgehog during construction	Minor Adverse (Site Level)	CEMP to include measures to safeguard hedgehogs and brown hare during construction	Planning Condition	Negligible
	Enhancement of habitats for hedgehogs and terrestrial invertebrate assemblages	Negligible/Minor Beneficial (Site Level)	LEMP at reserved matters stage to set out detail of planting for benefit of hedgehogs, invertebrates and installation of bug boxes	Planning Condition	Minor Beneficial (Site Level)
Flood Risk and Drainage	Impacts of construction on watercourse water quality	Moderate/Minor Adverse	CEMP	Planning Condition	Negligible
	Impacts of construction on watercourse flood risk and temporary flood risk	Minor Adverse/ Negligible	CEMP	Planning Condition	Negligible
	Impacts of construction on watercourse geomorphology	Minor Adverse/ Negligible	CEMP	Planning Condition	Negligible
	Impacts of construction on surface water flood risk and temporary surface water flood risk	Minor Adverse	CEMP	Planning Condition	Negligible

ENVIRONMENTAL ASPECT	DESCRIPTION OF EFFECT	SIGNIFICANCE	MITIGATION MEASURES PROPOSED	MECHANISM OF CONTROL/DELIVERY	RESIDUAL EFFECT
Flood Risk and Drainage	Impacts of construction on surface water quality	Moderate/Minor Adverse	CEMP	Planning Condition	Negligible
	Impacts of construction on groundwater	Minor Adverse/ Negligible	CEMP	Planning Condition	Negligible
	Impacts of construction on the public sewer network	Minor Adverse	Prior approval from Anglian Water	N/A	Negligible
	Impacts of the Proposed Development on surface water flood risk	Minor Adverse	Surface Water Drainage Strategy/development layout/raised finished floor levels	Design as proposed	Negligible
	Impacts of the Proposed Development on watercourse flood risk	Minor Adverse/ Negligible	Surface Water Drainage Strategy/development layout/raised finished floor levels/location of Site in Flood Zone 1	Design as proposed	Negligible
	Impacts of the Proposed Development on surface water quality	Moderate/Minor Adverse	Surface Water Drainage Strategy	Design as proposed	Minor Beneficial
	Impacts of the Proposed Development on watercourse water quality	Moderate/Minor Adverse	Surface Water Drainage Strategy	Design as proposed	Negligible
	Impacts of the Proposed Development on the public sewer network	Moderate/Minor Adverse	Agreement with Anglian Water for sewer network capacity upgrade where required	Legal Agreement	Negligible
Landscape & Visual	Landscape Receptors				
	Landscape elements and landscape pattern of the Site	Construction Phase: Moderate-Major Adverse One year post completion: Moderate Adverse	Although housing will replace the existing agricultural land use, the retention of the existing field boundaries will minimise the change to the landscape pattern. Introduction of characteristic landscape features to the Site (woodland blocks on high ground, SuDS features inspired by the shape and form of local moats, strengthening of existing tree belts with additional tree planting) will help to integrate the Site to the surrounding landscape character	Embedded within Masterplan Design & Planning Conditions	Minor Neutral Adverse

ENVIRONMENTAL ASPECT	DESCRIPTION OF EFFECT	SIGNIFICANCE	MITIGATION MEASURES PROPOSED	MECHANISM OF CONTROL/DELIVERY	RESIDUAL EFFECT
Landscape & Visual	Introduction of uncharacteristic elements to the Site and impact upon local landscape character	Construction Phase: Moderate Adverse One year post completion: Moderate - Minor Adverse	Although housing will replace the existing agricultural land use, the retention of existing landscape features along the Site boundaries, and introduction of landscape elements typical of the local landscape (woodland blocks on high ground, SuDS features inspired by the shape and form of local moats, strengthening of existing tree belts with additional tree planting) will minimise the impact of the introduced new housing	Embedded within Masterplan Design & Planning Conditions	Minor Adverse
	Settlement identity of Swards End	Construction Phase: Minor Adverse One year post completion: Minor Adverse		Embedded within Masterplan Design & Planning Conditions	Minor-Negligible Adverse
	Visual Receptors				
	Group 1: Views from the North (Radwinter Road - Viewpoint 1 & 2)	Construction Phase: Minor Adverse One Year Post Completion: Minor Adverse	Tree planting along Radwinter Road is retained with the exception of tree removal to provide access. The small, linear field in the north of the Site is retained as open space, with adjacent hedge-row retained. The retained field boundaries will minimise views of proposed construction activity	Embedded within Masterplan Design & Planning Conditions	Negligible
	Group 2 - Views from Footpaths to the north - Viewpoints 3 and 3.a)	Construction Phase: Moderate Adverse One Year Post Completion: Moderate/Minor Adverse	The most visible part of the Site is the southern portion, on the highest land. This area is retained as public open space and minimal construction activity will be undertaken. Groups of trees are proposed within the public open space, referencing the characteristic visual feature of woodland blocks on hilltops.	Embedded within Masterplan Design & Planning Conditions	Minor Adverse

ENVIRONMENTAL ASPECT	DESCRIPTION OF EFFECT	SIGNIFICANCE	MITIGATION MEASURES PROPOSED	MECHANISM OF CONTROL/DELIVERY	RESIDUAL EFFECT
Landscape & Visual	Group 3: Views from PRoW to the south (Viewpoints 4, 5, 9 and 10)	Negligible	The proposed Site and mitigation would not be visible to these receptors	N/A	Negligible
	Group 4: View from western Safron Walden on higher ground (Viewpoints 6 & 12)	Negligible	The proposed Site and mitigation would not be visible to these receptor	N/A	Negligible
	Group 5: Views from PRoW to the north-west of the site (Viewpoints 7 & 7a)	Construction Phase: Moderate/Major Adverse One Year Post Completion: Moderate/Major Adverse	The most visible part of the Site is the southern portion, on the highest land. This area is retained as public open space and minimal construction activity will be under-taken. Boundary vegetation surrounding the Site will be retained, and will help to retain an element of continuity to views experienced.	Embedded within Masterplan Design and Planning Conditions	Moderate Adverse
	Group 6: Views from PRoW to the north-east of the site (Viewpoint 8 & 13)	Negligible	The proposed Site and mitigation would not be visible to these receptors	N/A	Negligible
	Group 7: Views from Beechy Ride PRoW, south-west of the Site (Viewpoint 11)	Negligible	The proposed Site and mitigation would not be visible to these receptors	N/A	Negligible
Noise and Vibration	Construction Noise – When works undertaken at the Turnip Hall Farm	Major Adverse	CEMP	Planning Condition	Major Adverse
	Construction Noise – When works undertaken at Pearson Road, Sativus Close, Fairfax Drive	Minor Adverse	CEMP	Planning Condition	Minor Adverse
	Construction Noise – When works undertaken at 1 Radwinter Road, The Vineyard	Negligible	CEMP	Planning Condition	Negligible

ENVIRONMENTAL ASPECT	DESCRIPTION OF EFFECT	SIGNIFICANCE	MITIGATION MEASURES PROPOSED	MECHANISM OF CONTROL/DELIVERY	RESIDUAL EFFECT
Noise and Vibration	Construction Noise – When works undertaken at average distance from receptors	Negligible	CEMP	Planning Condition	Negligible
	Construction Vibration – When works undertaken at Turnip Hall Farm	Moderate Adverse	CEMP	Planning Condition	Moderate Adverse
	Construction Vibration – When works undertaken at Pearson Road, Sativus Close, Fairfax Drive, 1 Radwinter Road, The Vineyard	Minor Adverse	CEMP	Planning Condition	Minor Adverse
	Construction Vibration – When works undertaken at average distance from receptors	Negligible	CEMP	Planning Condition	Negligible
	Construction Traffic	Negligible	CEMP	Planning Condition	Negligible
	Operational Traffic Noise – All links except Newport (Link ID K1) in short-term, all links in long-term	Negligible	None proposed	N/A	Negligible
	Operational Traffic Noise Newport (Link ID K1) in short-term	Minor Beneficial	None proposed	N/A	Minor Beneficial
	Operational Traffic Vibration - All Roads	Negligible	None proposed	N/A	Negligible
	Construction				
Socio-Economics	Direct, indirect an induced employment	Minor Beneficial	N/A	N/A	Minor Beneficial

ENVIRONMENTAL ASPECT	DESCRIPTION OF EFFECT	SIGNIFICANCE	MITIGATION MEASURES PROPOSED	MECHANISM OF CONTROL/DELIVERY	RESIDUAL EFFECT
Socio-Economics	Operation				
	Housing provision	Moderate/Minor Beneficial	N/A	N/A	Moderate/Minor Beneficial
	Increase in economic growth and employment	Minor Beneficial	N/A	N/A	Minor Beneficial
	Increase demand in education	Minor Adverse	N/A	N/A	Minor Adverse
	Increase demand for healthcare	Minor Adverse	N/A	N/A	Minor Adverse
	Open space	Minor Beneficial	N/A	N/A	Minor Beneficial
	Crime reduction and safety	Minor Beneficial	N/A	N/A	Minor Beneficial
Transport	Construction Phase				
	Severance	Moderate Adverse	CEMP	Planning Condition	Minor Adverse
	Driver delay	Minor Adverse	CEMP	Planning Condition	Minor Adverse
	Pedestrian delay and amenity	Moderate Adverse	CEMP	Planning Condition	Minor Adverse
	Accidents and safety	Moderate Adverse	CEMP	Planning Condition	Minor Adverse
	Hazardous loads	No change	CEMP	Planning Condition	Minor Adverse/ Negligible
	Fear and intimidation	Moderate Adverse	CEMP	Planning Condition	Minor Adverse
	Operational Development				
	Severance	Negligible	Highway Improvements at three junctions. New footway link on Radwinter Road. Provision of new bus stops and financial contribution to bus service provision. Travel Plan.	Design as Proposed	Negligible
	Driver delay	Moderate Adverse		Travel Plan can be secured by Planning Condition, and financial contributions via S106 Agreement.	Minor Adverse
Climate Change	Pedestrian delay and amenity	Minor Adverse			Minor Adverse
	Accidents and safety	Minor Adverse			Minor Adverse
	Hazardous loads	No change			Minor Adverse/ Negligible
	Fear and intimidation	Minor Adverse			Minor Adverse
	Climate Change Mitigation				
	Construction Phase: GHG emissions produced during the construction of the proposed development.	Significant	Buildings will meet the standards of the most up to date Building Regulation Part L.	Separate legislative regime (Building Regulations) in place to control this	Slight (Intermediate) Adverse

ENVIRONMENTAL ASPECT	DESCRIPTION OF EFFECT	SIGNIFICANCE	MITIGATION MEASURES PROPOSED	MECHANISM OF CONTROL/DELIVERY	RESIDUAL EFFECT
Climate Change	Operation phase: GHG emissions produced once the Proposed Development is complete and occupied.	Significant	The scheme will be designed and built in current or future Buildings Regulations.	Separate legislative regime (Building Regulations) in place to control this	Slight (Intermediate) Adverse
	Vulnerability to Climate Change				
	Construction Phase: Potential effects on the construction works derived from climatic changes	Negligible	CEMP.	Planning Condition	Negligible
	Operation: Potential effects on the future residents and users of the non-residential uses during the operation of the development	Minor	The scheme will be designed and built in current or future Buildings Regulations.	Separate legislative regime (Building Regulations) in place to control this	Negligible
Major Accidents & Disasters	There are no residual effects as all of the MA&D event categories and types have been scoped out from further assessment.				

Concluding Remarks

- 17.58 As illustrated in **Table 17.2A**, the residual impacts arising from the Proposed Development range from Minor Beneficial to Minor/Moderate Adverse with the majority of impacts being considered negligible or not significant. Many of the adverse impacts are short-term and temporary in nature with most being reduced in their significance with time and as the effectiveness of tried and tested mitigation measures are put in place to further manage and reduce these impacts.
- 17.59 The exception to this relates to an existing receptor (Turnip Hall Farm) on the Site boundary, where at very specific times of construction there is the residual potential for major adverse construction noise impacts. However, the duration of these impacts are expected to be limited, temporary and short in duration over the construction period.
- 17.60 After considering realistic alternative designs and layouts for the Proposed Development, and taking into account proposed mitigation measures, it has been demonstrated that where possible, through the design evolution of the proposals, the potential environmental effects have been avoided, or where this is not possible, the potential environmental effects have been reduced through mitigation. This has resulted in delivering an overall scheme which has had regard to minimising its environmental effects and delivering a sustainable form of development which achieves this.

References

18.0 References

Air Quality Consultants 2020 Emission Factor Toolkit Online at <https://www.aqconsultants.co.uk/news/march-2020/defra%E2%80%99s-emission-factor-toolkit-now-matching-measu>

Air Quality Regulations 2010 – Statutory Instrument 2010 No. 1001 Online at <https://www.legislation.gov.uk/uksi/2010/1001/contents/made>

ARG UK (2010) ARG UK Advice Note 5: Great Crested Newt Habitat Suitability Index. Amphibian and Reptile Groups of the United Kingdom.

Ark Consultants, (2020); Uttlesford And Braintree District Councils: Housing for New Communities in Uttlesford and Braintree.

Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/957687/2019_Final_emissions_statistics_one_page_summary.pdf

Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/996056/2005-19-local-authority-co2-emissions-statistical-release.pdf

Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/69446/pb13583-biodiversity-strategy-2020-111111.pdf

Available at: [https://www.iema.net/assets/templates/documents/iema_guidance_documents_eia_climate_change_resilience_and_adaptation%20\(1\).pdf](https://www.iema.net/assets/templates/documents/iema_guidance_documents_eia_climate_change_resilience_and_adaptation%20(1).pdf)

Available at: https://www.metoffice.gov.uk/binaries/content/assets/metofficegovuk/pdf/weather/learn-about/uk-past-events/regional-climates/southern-england_-_climate---met-office.pdf

Bat Conservation Trust (BCT) 2016. Bat Surveys for Professional Ecologists, Good Practice Guidelines, 3rd Edition

BCT (2015) Surveying for Bats in Trees and Woodland – Guide

BEIS, 2019. 2019 UK Greenhouse Gas Emissions. [Online]

BEIS, 2021. UK local authority carbon dioxide emissions estimates 2019. [Online]

BJ Unwin Forestry Consultancy (2021) Tree Impact and Tree Protection Method Statement

Bright, P., Morris, P. and Mitchell-Jones, T. (2006) The dormouse conservation handbook. Second edition. English Nature, Peterborough.

British Geological Survey (2021) Geology of Britain Viewer. Online at http://mapapps.bgs.ac.uk/geologyofbritain/home.html?&_ga=2.93601565.1617062886.1611052673-1868461616.1604492042 Accessed February 2021

British Standard 5228: 2009+A1: 2014 Code of practice for noise and vibration control on construction and open sites, BSi (2014)

British Standard 7385-2: 1993 Evaluation and measurement for vibration in buildings. Part 2 – Guide to damage levels from groundborne vibration

Calculation of Road Traffic Noise, Department of Transport etc al (1988)

Care Quality Commission, Active locations for providers registered under the Health and Social Care Act (HSCA) (2021). Online at <https://www.cqc.org.uk/about-us/transparency/using-cqc-data>, accessed 17/05/21.

Centre for Research on the Epidemiology of Disasters, The International Disaster Database (2021). Online at <https://www.emdat.be/>, accessed 01/12/21

Chemical and Downstream Oil Industries Forum, Guideline - Environmental Risk Tolerability for COMAH Establishments. Retrieved from SEPA (2013). Online at https://www.sepa.org.uk/media/219154/cdoif_guideline_environmental_risk_assessment_v2.pdf, accessed 01/12/21

CIEEM (2018) Guidelines for Preliminary Ecological Appraisal. 2nd Edition. CIEEM, Winchester.

COMAH Competent Authority, "All Measures Necessary" – Environmental Aspects (2016). Online at https://www.sepa.org.uk/media/219152/d130416_all-measures-necessary-guidance.pdf

Committee on Climate Change, (2016); UK Climate Change Risk Assessment 2017 Evidence Report.

Cranfield Soil and AgriFood Institute (2021) Soilsclapes Map. Online at <http://www.landis.org.uk/soilsclapes/> Accessed February 2021

Daynurseries.co.uk Reviews for Day Nurseries & Nursery Schools. Online at <https://www.daynurseries.co.uk/>, accessed 21/04/21.

Dean, M., Strachan, R., Gow, D. and Andrews, R. (2016) The Water Vole Mitigation Handbook (The Mammal Society Mitigation Guidance Series). Eds Mathews, F. and Chanin, P. The Mammal Society, London.

Defra 2020 NOx to NO2 converter Online at <https://laqm.defra.gov.uk/review-and-assessment/tools/background-maps.html#NOxNO2calc>

Defra 2020 UK Air Information Resource Emissions Factor Tool Kit, Online at <https://laqm.defra.gov.uk/review-and-assessment/tools/emissions-factors-toolkit.html>

Defra MAGIC online at <https://magic.defra.gov.uk/MagicMap.aspx>

Defra, 2018 UK Air Information Resource Background Mapping Online at <https://uk-air.defra.gov.uk/data/laqm-background-maps?year=2018>

defra, 2020. Biodiversity 2020: A strategy for England's wildlife and ecosystem services. [Online]

Department for Environment Food and Rural Affairs, Local Air Quality Management Policy Guidance (PG16), LAQM.PG(16) Online at <https://www.legislation.gov.uk/ukpga/1990/43/contents>

Department for Environment Food and Rural Affairs, Local Air Quality Management Technical Guidance, LAQM. TG(16) Online at <https://laqm.defra.gov.uk/technical-guidance/>

Department for Environment, Food & Rural Affairs, Guidelines for Environmental Risk Assessment Green Leaves III (2011). Online at <https://www.gov.uk/government/publications/guidelines-for-environmental-risk-assessment-and-management-green-leaves-iii>, accessed 01/12/21

Department for the Environment, Food & Rural Affairs (DEFRA) (2021) Magic Map Application. Online at <https://magic.defra.gov.uk/MagicMap.aspx> Accessed February 2021

Department of Education, Get information about schools (2021). Online at <https://www.get-information-schools.service.gov.uk/>, accessed 21/04/21.

Design Manual for Roads and Bridges (DMRB) LA 111 Noise and vibration (2020)

Directive 2008/50/EC of the European Parliament and of the Council of 21 May 2008 on ambient air quality and cleaner air for Europe Online at <https://www.legislation.gov.uk/eudr/2008/50/contents>

Environment Agency (2021) Flood Map for Planning. Online at <https://flood-map-for-planning.service.gov.uk/> Accessed February 2021

Environment Agency (2021) Long Term Flood Risk Map. Online at <https://flood-warning-information.service.gov.uk/long-term-flood-risk/map> Accessed February 2021

Essex County Council (2020) The Sustainable Drainage Systems Design Guide for Essex. Online at <https://www.essexdesignguide.co.uk/suds> Accessed March 2021

Essex County Council, (2019); Essex County Council Developers' Guide to Infrastructure Contributions (2019).

Essex County Council, (2019); Joint Strategic Needs Assessment 2019: Uttlesford Local Authority Profile.

Essex School Organisation Service, (no date); 10 Year Plan: Meeting the demand for school places in Essex 2021 – 2030.

European Parliament, Seveso III Directive (2012). Online at <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex%3A32012L0018>, accessed 01/12/21

H. Masters-Williams et al, (2001) Control of Water Pollution from Construction sites. Guidance for consultants and contractors (C532). London. Construction Industry Research & Information Association (CIRIA).

Health and Safety Executive, A Guide to the Control of Major Accident Hazards Regulations (COMAH) (2015). Online at <https://www.hse.gov.uk/pubns/books/l111.htm>, accessed 01/12/21

HM Government, Control of Major Accident Hazard Regulations (2015). Online at <https://www.legislation.gov.uk/uksi/2015/1393/made/>, accessed 01/12/21

HM Government, Guidance: National Risk Register (2020). Online at <https://www.gov.uk/government/publications/national-risk-register-2020>, accessed 01/12/21

HM Government, Health and Safety at Work etc. Act (1974). Online at <https://www.legislation.gov.uk/ukpga/1974/37/contents>, accessed 01/12/21

HM Government, The Construction (Design and Management) Regulations (2015). Online at <https://www.legislation.gov.uk/uksi/2015/51/contents/made>, accessed 01/12/21

HM Government, The Major Accident Off-Site Emergency Plan (Management of Waste from Extractive Industries) (England and Wales) Regulations (2009). Online at <https://www.legislation.gov.uk/uksi/2009/1927/contents>, accessed 01/12/21

HM Government, The Pipelines Safety Regulations (1996). Online at <https://www.legislation.gov.uk/uksi/1996/825/regulation/14/made> accessed 01/12/21

HM Government, The Town and Country Planning (Environmental Impact Assessment) Regulations (2017). Online at <https://www.legislation.gov.uk/uksi/2017/571/contents/made>, accessed 01/12/21

Home Builders Federation, (2018); The Economic Footprint of House Building in England and Wales.

IAQM (2014) Guidance on the Assessment of Dust from Demolition and Construction Version 1.1, IAQM, London

IAQM (2017) Land Use Planning & Development Control: Planning for Air Quality, IAQM, London

IEMA (1993) Guidelines for the Environmental Assessment of Road Traffic

IEMA, 2020. EIA Guide to: Climate Change Resilience & Adaptation. [Online]

ILP (2018) Bats and artificial lighting in the UK. Guidance Note 08/18. Bat Conservation Trust, London

Institute of Environmental Management & Assessment, IEMA Major Accidents and Disasters in EIA Guide (2020). Online at <https://www.iema.net/resources/blog/2020/09/23/iema-major-accidents-and-disasters-in-eia-primer>, accessed 01/12/21

International Standards Organisation, ISO 31000:2018 Risk management – Guidelines (2018). Online at <https://www.iso.org/standard/65694.html>, accessed 01/12/21

Investment and Performance Board, Measuring Jobs from the Housing Programme. 2014. Online at: https://www.london.gov.uk/moderngovmb/documents/s38594/Measuring%20Jobs_Appendix%203.pdf, accessed 01/06/21.

JBA Consulting, (2016) Uttlesford District Council Strategic Flood Risk Assessment (SFRA). Online at https://www.uttlesford.gov.uk/media/5545/Uttlesford-Strategic-Flood-Risk-Assessment-May-2016/pdf/2015s2938_-_Uttlesford_SFRA_v3.0.pdf?m=636005689900470000 Accessed March 2021

JNCC (2010) Handbook for Phase 1 habitat survey - A technique for environmental audit. JNCC, Peterborough.

Knight, Kavanagh & Page Ltd, (2019a); Uttlesford District Council Indoor and Built Facilities Strategy Report February 2019.

Knight, Kavanagh & Page Ltd, (2019b); Uttlesford District Council Playing Pitch Strategy Assessment Report May 2019.

Knight, Kavanagh & Page Ltd, (2019c); Uttlesford District Council Open Space Assessment Report February 2019.

Knight, Kavanagh & Page Ltd, (2019d); Uttlesford District Council Open Standards Paper February 2019.

Land Registry, UK House Price Index. Online at <https://landregistry.data.gov.uk/app/ukhpi>, accessed 21/04/21.

Lichfields and Home Builders Federation, 2018; The Economic Footprint of House Building in England and Wales.

MetOffice, 2016. Southern England: climate. [Online]

Ministry of Housing, Communities & Local Government, English indices of deprivation (2019). Online at <https://www.gov.uk/government/statistics/english-indices-of-deprivation-2019>, accessed 21/04/21.

Ministry of Housing, Communities and Local Government, (2019) National Planning Policy Framework (NPPF). London. Controller of Her Majesty's Stationery Office.

Ministry of Housing, Communities and Local Government, (2019) National Planning Policy Practice Guidance (PPG). Online at <https://www.gov.uk/government/collections/planning-practice-guidance> Accessed May 2021

Ministry of Housing, Communities and Local Government: National Planning Policy Framework (February 2019) Online at <https://www.gov.uk/government/publications/national-planning-policy-framework--2>

Mitchell-Jones, A.J. & McLeish, A.P. Ed. 2004. Bat Workers' Manual 3rd Edition

Natural England (2015) Monitor of Engagement with the Natural Environment <file:///C:/Users/rob.harrison/Downloads/152001%20MENE%20Year%205%20Annual%20Report.pdf> [accessed 06/11/2018]

NHS Digital, General Practice Workforce 31 March 2021. Online at <https://digital.nhs.uk/data-and-information/publications/statistical/general-and-personal-medical-services/31-march-2021>, accessed 19/05/21.

NHS, Find Services Near You (2021). Online at <https://www.nhs.uk/service-search>, accessed 19/05/21.

Oldham et al., 2000. Evaluating the suitability of habitat for the Great Crested Newt (*Triturus cristatus*). Herpetological Journal 10, 143-155

ONS, Annual Population Survey (2020). Online at <https://www.nomisweb.co.uk/home/detailedstats.asp>, accessed 18/05/21.

ONS, Business Register and Employment Survey (2020). Online at <https://www.nomisweb.co.uk/home/detailedstats.asp>, accessed 18/05/21.

ONS, Census 1991 (1991). Online at <https://www.nomisweb.co.uk/home/detailedstats.asp>, accessed 21/04/21.

- ONS, Census 2001 (2001). Online at <https://www.nomisweb.co.uk/home/detailedstats.asp>, accessed 21/04/21.
- ONS, Census 2011 DC4405EW - KS101EW - Tenure by household size by number of bedrooms (2011). Online at <https://www.nomisweb.co.uk/home/detailedstats.asp>, accessed 24/05/21.
- ONS, Census 2011 KS101EW - Usual resident population (2011). Online at <https://www.nomisweb.co.uk/home/detailedstats.asp>, accessed 21/04/21.
- ONS, Census 2011 KS402EW – Tenure (2011). Online at <https://www.nomisweb.co.uk/home/detailedstats.asp>, accessed 21/04/21.
- ONS, Census 2011 KS501EW - Qualifications and students (2011). Online at <https://www.nomisweb.co.uk/home/detailedstats.asp>, 21/04/21.
- ONS, Census 2011 KS601EW to KS603EW (2011). Online at <https://www.nomisweb.co.uk/home/detailedstats.asp>, 18/05/21.
- ONS, Census 2011 QS102UK - Population density (2011). Online at <https://www.nomisweb.co.uk/home/detailedstats.asp>, accessed 21/04/21.
- ONS, Family spending in the UK: April 2019 to March 2020 (2021). Online at: <https://www.ons.gov.uk/peoplepopulationandcommunity/personalandhouseholdfinances/expenditure/bulletins/familyspendingintheuk/april2019tomarch2020>, accessed 24/05/21.
- ONS, Population estimates (2019). Online at <https://www.nomisweb.co.uk/home/detailedstats.asp>, accessed 21/04/21.
- Open Research Services, (2017); West Essex and East Hertfordshire Strategic Housing Market Assessment: Establishing the Full Objectively Assessed Need.
- Organisational Intelligence and Essex County Council, (2016). Essex Local Authority Portraits A product of the Essex Joint Strategic Needs Assessment (JSNA): A profile of people living in Uttlesford.
- Peay, S. (2003) Monitoring the White-clawed Crayfish *Austropotamobius pallipes*. Conserving Natura 2000 Rivers Monitoring Series No. 1, Peterborough: English Nature.
- Saffron Walden Reporter (2016) Flooded roads cause traffic disruption around Saffron Walden. Online at <https://www.saffronwalderenreporter.co.uk/news/flooded-roads-cause-traffic-disruption-around-saffron-walden-5332978> Accessed March 2021
- Saffron Walden Town Council, Visit Saffron Walden, Online at <https://www.visitsaffronwalden.gov.uk/>, accessed 18/05/21.
- Secretary of State, The Environment Act 1990 HMSO Online at <https://www.legislation.gov.uk/ukpga/1990/43/contents>
- The Air Quality Strategy for England, Scotland, Wales and Northern Ireland – July 2007 Online at <https://www.gov.uk/government/publications/the-air-quality-strategy-for-england-scotland-wales-and-northern-ireland-volume-1>
- The International Federation of Red Cross and Red Crescent Societies, Early Warning, Early Action (2021). Online at <https://www.ifrc.org/early-warning-early-action>, accessed 01/12/21
- TRL (1991) The Appraisal of Community Severance. Contractors Report 135.
- TRL Report 53 Ground vibration caused by civil engineering works, Transport Research Laboratory (1986)
- Uttlesford District Council (2005) Local Plan. Online at <https://www.uttlesford.gov.uk/local-plan-2005> Accessed March 2021

Uttlesford District Council (2016) Strategic Flood Risk Assessment. Online at <https://www.uttlesford.gov.uk/article/4937/Environment> Accessed March 2021

Uttlesford District Council (2018) Air Quality Technical Planning Guidance, Uttlesford District Council, Uttlesford

Uttlesford District Council, Uttlesford Local Plan (Adopted 2005), Online at: https://www.uttlesford.gov.uk/media/4723/Uttlesford-Local-Plan-Adopted-January-2005/pdf/Local_Plan_2005.pdf?m=637471937917270000, accessed 25/05/21

Uttlesford District Council, Uttlesford Local Plan, January 2005 Online at <https://www.uttlesford.gov.uk/local-plan-2005>

Uttlesford Wellbeing Impact Checklist, Online at: <https://www.uttlesford.gov.uk/article/2721/Health-and-Wellbeing-Impact-Checklist>, accessed 26/05/21.

Wembridge, D., Al-Fulaij, N. & Langton, S. (2016) The state of Britain's Dormice in 2016. PTES, London

West Essex CCG, Letter to Uttlesford District Council. 26 August 2020. Ref. WECCG/UTT/20/2007/GR. Online at https://publicaccess.uttlesford.gov.uk/online-applications/files/E6BBE6DF80267F2D07A5E4AD79AE0906/pdf/UTT_20_2007_FUL-NHS_RESPONSE-3440912.pdf, access 02/06/21.

Woods Ballard, B, Wilson, Udale-Clarke, H, Illman, S, Scott, T, Ashley, R, Kellagher, R, (2015). The SuDS Manual (C753). London Construction Industry Research & Information Association (CIRIA).

Woods, M., McDonald, R.A. & Harris, S. (2003) Predation of wildlife by domestic cats *Felis catus* in Great Britain. Mammal Review, 33, 174-188.

