Tritax Symmetry (Hinckley) Limited

HINCKLEY NATIONAL RAIL FREIGHT INTERCHANGE

Preliminary Environmental Information Report

Contents and glossary

January 2022

This document forms a part of a Preliminary Environmental Information Report (PEIR) for the Hinckley National Rail Freight Interchange project.

A PEIR presents environmental information to assist consultees to form an informed view of the likely significant environmental effects of a proposed development and provide feedback.

This PEIR has been prepared by the project promoter, Tritax Symmetry (Hinckley) Limited. The Proposed Development is described in Chapter 3 of the PEIR and is the subject of a public consultation running from 12 January to 9 March 2022.

Details of how to respond to the public consultation are provided at the end of Chapter 1 of the PEIR and on the project website:

http://www.hinckleynrfi.co.uk/

This feedback will be taken into account by Tritax Symmetry (Hinckley) Limited in the preparation of its application for a Development Consent Order for the project.

Tritax Symmetry (Hinckley) Limited

HINCKLEY NATIONAL RAIL FREIGHT INTERCHANGE

Preliminary Environmental Information Report:

Contents and glossary

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GLOSSARY AND ABBREVIATIONS

Full Text	Acronym/ Abbreviation	Notes
Tritax Symmetry (Hinckley) Limited	TSH	When referring to the 'applicant'.
Hinckley National Rail Freight Interchange	HNRFI	
Strategic Rail Freight Interchange	SRFI	
The DCO Site		All of the land inside the draft DCO Order Limits.
Main HNRFI Site		All of the land inside the draft DCO Order Limits between the Leicester to Hinckley railway to the north-west and the M69 motorway to the south-east, in which the proposed SRFI would be located.
Main Order Limits		The draft Order Limits that contain the Main HNRFI Site together with the corridor of a proposed link road to the B4668/A47 Leicester Road (the 'A47 Link Road'), proposed works to M69 Junction 2 and a section of the B4669 Hinckley Road towards the village of Sapcote.
Principal Development		SRFI - New rail infrastructure providing access to a series of parallel sidings - Intermodal freight terminal ('railport') capable of accommodating up to 16 trains of up to 775m in length - Hard surfaces areas for container storage - Up to 850,000m^2 GIA of warehousing and ancillary buildings with a total footprint of 650,000m^2 & up to 200,000m^2 of mezzanine floorspace - Lorry park with fuel filling station - Energy centre incorporating an electricity sub-station connected to the local

Full Text	Acronym/ Abbreviation	Notes
		distribution network and a gas-fired heat and power plant (10MW) generation capacity fed from solar PV including standby capacity (20MWe) and battery (20MWe) - Terrain remodelling, hard and soft landscape works, amenity water features and planting - Noise attenuation measures – acoustic barriers up to 6m in height - Pedestrian, equestrian and cycle access routes and infrastructure M69 upgrade works - New access road connecting to an internal road network serving the SRFI - New rail bridge within the SRFI site - New junction at B4668 / A74 Leicester Road link road form M69 junction 2 to the B4668 / A47 Leicester Road - Reconfiguration of existing roundabout and approach lanes - Additional northbound and southbound slip roads
Associated Development	AD	- utility compounds, plant and service infrastructure; - drainage works including groundwater retention ponds, underground attenuation tanks and swales. A swale is a grassed depression in the ground that provides temporary storage for storm water and reduces peak flows; - habitat creation and enhancement and public access, including the provision of amenity open space at the south-western extremity of the SRFI near Burbage Wood and a new route for pedestrians, cyclists and horse riders from a point south of Elmesthorpe to Burbage Common;

Full Text	Acronym/ Abbreviation	Notes
		- works affecting existing pedestrian level crossings on the Leicester to Hinckley railway at Thorney Fields Farm north-west of Sapcote, Elmesthorpe, near Billington Rough to the south of Elmesthorpe and between Burbage and Hinckley; - security and safety provisions inside the SRFI including fencing and lighting
Proposed Development	-	The DCO application
Off-site highway works	-	- A47 Link Road - Eastern Villages by-pass - M69 junction 2 enhancement - M1 junctions 21 enhancement - Minor off-site highway works
Other works	-	Landscape and planting works, ecological mitigation, drainage balancing ponds, heavy goods vehicle parking area, energy centre and footpath, cycleway and bridleway routes and connections.
Above Ordnance Datum	AOD	Height of land surface above sea level.
Additionality		The extent to which something happens as a result of an intervention (in this case the proposed HNRFI) that would not have occurred in the absence of the intervention.
Agricultural Land Classification	ALC	

Full Text	Acronym/ Abbreviation	Notes
Air Quality Assessment	AQA	
Air Quality Limit Value Regulations 2010	-	UK regulations to limit the levels of air borne pollutants emitted from industries.
Air Quality Management Area	AQMA	An area designated as being at risk of not meeting air quality standards by a local authority.
Air Quality Management Plan	AQMP	A plan developed to improve the air quality in the air quality management area.
Air Quality Modelling and Assessment Unit	AQMAU	An Environment Agency team that targets air quality related issues.
Air Quality Strategy	AQS	The AQS for England, Scotland, Wales and Northern Ireland provides details of national air quality standards and objectives for a number of local air pollutants.
Ancient Woodland	-	A woodland that has existed continuously since 1600 or before.
Annual Average Daily Traffic	AADT	Measurement unit for the total volume of vehicle traffic to indicate how busy the road is.
Application	-	The DCO application for the Scheme made to the Secretary of State under the Planning Act 2008.
Applications: Prescribed Forms and Procedure Regulations	APFP	The Infrastructure Planning Regulations 2009, as amended, which prescribe various matters in connection with the making of an application for development consent under the Planning Act 2008.

Full Text	Acronym/ Abbreviation	Notes
Area of Local Landscape Value	ALLV	
Asbestos Containing Material	ACM	Any material containing more than 1% asbestos.
Automatic Traffic Count	ATC	Means of determining traffic levels in the vicinity.
Automatic Urban and Rural Network	AURN	Air quality monitoring site.
B8	B8	Storage and distribution uses (a classification of uses under the Town and Country Planning Order 1987)
Best Available Technique	BAT	The most effective and advanced stage in the development of activities and their methods of operation.
Best and Most Versatile Agricultural Land	BMV	Agricultural land within Grades 1, 2 and Subgrade 3a of the ALC
Biodiversity Action Plan	BAP	Plan concerned with the protection of identified species and habitats.
Blaby District Council	BDC	Local Authority
British Geological Survey	BGS	The UK public body responsible for all aspects of geoscience.
BS 4142	-	Method for Rating Industrial Noise Affecting Mixed Residential and Industrial Areas (1997).

Full Text	Acronym/ Abbreviation	Notes
BS 8233	-	Guidance on sound insulation and noise reduction for buildings (2014).
BS5228	-	Code of Practice for Noise and Vibration Control on Construction and Open Sites 2009 (2009).
BS5873	-	Guidance in relation to trees and design, demolition and construction
CadnaA	-	Noise modelling software
CAoL Guidance	-	Department of Communities and Local Government guidance 'Planning Act 2008: Guidance related to procedures for the compulsory acquisition of land' (September 2013).
Candidate Local Wildlife Sites	cLWS	Wildlife rich sites nominated for their local nature conservation value.
Carbon Dioxide	CO_2	A primary greenhouse gas emitted through human activities as well as natural sources.
Carbon Monoxide	CO	
Chamber of Commerce	CoC	A network of businesses to represent business interests.
Civil Aviation Authority	CAA	A statutory corporation that oversees and regulates civil aviation in the UK.
Classified Turning Counts	CTC	Measurement of vehicle traffic in particular at junctions.

Full Text	Acronym/ Abbreviation	Notes
Coal Authority	-	A non-governmental body that manages coal mining operations and coal reserves throughout the UK.
Construction Industry Research and Information Association	CIRIA	-
Code of Construction Practices	CoCP	A guidance document that sets out standards and procedures for managing environmental impact of constructing major schemes.
Commercial and Industrial waste	C&I	A type of waste from businesses that does not include construction and demolition waste.
Common Bird Census	CBC	A standardised methodology to map breeding bird territories.
Committee on the Medical Effects of Air Pollutants	COMEAP	An advisory body that advises the UK government on all matters concerning the health effects of air pollutants.
Conceptual Site Model	CSM	A model that identifies the possible pathways by which a contaminant from a particular source can affect a particular receptor.
Conservation Areas	CA	An area of special architectural and historic interest designated by the local planning authority.
Conservation of Habitats and Species Regulations 2017	Habitats Regulations	
Construction Stage	-	The construction stage of the Scheme begins with enabling works, which will include site set-up and groundworks.
Construction and Demolition Waste	C&D	A type of construction waste as identified by the Environment Agency.

Full Text	Acronym/ Abbreviation	Notes
Construction Environmental Management Plan	CEMP	A plan by the contractor describing how the environmental impacts of construction activities of a project will be minimised and mitigated.
Construction Traffic Management Plan	CTMP	A plan by the construction contractor for managing construction traffic that is submitted to the relevant Highway Authority for approval.
Construction Travel Plan	CTP	A plan by the construction contractor for managing staff travel during the construction stage of a project (e.g. car sharing, public transport) that is submitted to the relevant Highway Authority for approval.
Contaminated Land Exposure Assessment	CLEA	
Cumulative Effects Assessment	CEA	
Daventry International Rail Freight Terminal	DIRFT	
dB(A)	-	A-weighted decibel – a correction applied to each frequency between 20 Hz and 20 kHz that effectively represents the way the human ear works.
Deadweight	-	An estimate of what level of target outputs/outcomes would be produced if the intervention did not go ahead.
Decibel	dB	Logarithmic scale for measuring sound levels.
Department for Environment, Food and Rural Affairs	DEFRA	The UK Government department responsible for environmental protection, food production and standards, agriculture, fisheries and rural communities in the UK.

Full Text	Acronym/ Abbreviation	Notes
Department for Transport	DfT	Government department responsible for transport.
Deposition	-	The main pathway for removing pollutants from the atmosphere, by settling on land.
Design Manual for Roads and Bridges	DMRB	A suite of technical documents produced by the Highways Agency that include guidance for environmental appraisal that are also used for non- highways schemes and as such are commonly used in EIA.
Determinand	-	A substance or parameter that is determined analytically, e.g. arsenic concentration in soil, pH of water, concentration of a particular gas in air quality modelling.
Development Consent Order	DCO	An order made under the Planning Act 2008 granting development consent for a Nationally Significant Infrastructure Project
Development Plan Documents	DPD	Includes Blaby Development Plan (including the Core Strategy 2013 and saved policies from Blaby District Local Plan 1999) and Hinckley and Bosworth Local Development Framework Core Strategy 2009.
Displacement	-	The proportion of intervention outputs accounted for by reduced outputs elsewhere in the target area.
UK Drinking Water Standards	DWS	
East Coast Mainline	ECML	
East Midlands Gateway Rail Freight Interchange	EMGRFI	

Full Text	Acronym/ Abbreviation	Notes
Ecological Construction Method Statement	ECMS	
Ecological Impact Assessment	EcIA	
Electric and Magnetic Fields	EMF	EMF's comprise electric and magnetic fields. Electric fields are the result of voltages applied to electrical conductors and equipment. Magnetic fields are produced by the flow of electric current.
Emission	-	The direct or indirect release of substances, vibrations, heat or noise from individual or diffuse sources into air, water or onto land, e.g. pollution may be discharged into the atmosphere from a stack or vent.
Emission Limit Value	ELV	Legal enforcement limit on the physical, chemical or biological characteristics of a point source of emission to water or air.
Energy Efficiency Directive 2012	-	The Directive establishes a framework of measures for the promotion of energy efficiency within the European Union.
English Heritage Archives	EHA	A public archive of architectural and archaeological records.
Environment Agency	EA	The non-departmental government body responsible for protection and enhancement of the environment in England and Wales.
Environmental DNA testing	eDNA	
Environmental Health Officer	EHO	A local authority health professional responsible for carrying out measures for protecting public health.

Full Text	Acronym/ Abbreviation	Notes
Environmental Impact Assessment	EIA	The process of evaluating the likely significant environmental impacts of a proposed project or development as part of the planning process.
Environmental Permit	EP	A permit required in accordance with the Environmental Permitting Regulations.
Environmental Permitting Regulations	EPR	The Environmental Permitting (England and Wales) Regulations 2010 (SI 2010/675) as amended that regulates practices that have pollution potential through a permitting system.
Environmental Protection Act 1990	EPA	The Act that covers, amongst other things, the regulation of contaminated land in the UK.
Environmental Quality Standards	EQS	The concentration of a particular pollutant or group of pollutants in water, sediment or biota which should not be exceeded in order to protect human health and the environment.
Environmental Statement	ES	The document which reports the process, findings and recommendations of the EIA carried out to assess the environmental impacts of the Scheme informed by the Scoping Opinion.
Environmentally Sensitive Area	ESA	A designation for agricultural areas needing special protection by virtue of their landscape, wildlife or historical value.
Felixstowe to Nuneaton freight line	F2N	The mainline railway to which the project connects.
Flood Defence Consent	FDC	A consent required by the Environment Agency, for construction or maintenance work on over, under or near a main river (usually within 8-10 metres).

Full Text	Acronym/ Abbreviation	Notes
Flood Risk Assessment	FRA	An assessment that determines the risk of flooding to a proposed project.
Freight Market Study	FMS	Network Rail Study from October 2013 setting out annual average growth forecasts for the intermodal subsectors.
Full Time Equivalent	FTE	The equivalent number of full time jobs provided by a project - e.g. two half-time jobs equates to one FTE.
Functional Economic Market Area	FEMA	Area not constrained by administrative boundaries but reflecting the way the economy works - in this case, Leicester and Leicestershire.
Generic Assessment Criterion	GAC	
Governance for Rail Investment Projects	GRIP	Network Rail's delivery mechanism for projects on operational railways.
Great Crested Newt	GCN	A species of newt protected by European Legislation.
Green Infrastructure	GI	
Gross External Area	GEA	Measure of floorspace
Gross Internal Area	GIA	
Gross Value Added	GVA	Gross value added is the measure of the value of goods and services produced in an area, industry or sector of an economy.

Full Text	Acronym/ Abbreviation	Notes
Groundwater Source Protection Zone	GSPZ	Areas around groundwater abstraction sources that are defined in order to help protect drinking water from contamination.
Growth Area	GA	
Guidance for the Environmental Assessment of Road Traffic	GEART	The IEMA guidance on the environmental assessment of road traffic.
Guidance on Transport Assessment	GTA	Department for Transport guidance dated March 2007 on the preparation of Transport Assessments as archived 22 October 2014 and replaced by NPPG "Transport evidence bases in plan making".
Guidelines for Landscape and Visual Impact Assessment, 3rd Edition	GLVIA	Guidance produced by the Landscape Institute and the Institute for Environmental Management and Assessment dated 17 April 2013.
Habitat Regulations Assessment	HRA	An assessment required under the European Directive 92/43/EEC.
Habitat Suitability Index	HSI	A method for assessing the suitability of ponds for their potential to support Great Crested Newts.
Health and Safety Executive	HSE	The non-departmental government body responsible for workplace safety in the UK.
Health Impact Assessment	HIA	
Heavy Goods Vehicle	HGV	A truck with a gross combination mass of more than 3500 kg.

Full Text	Acronym/ Abbreviation	Notes
Hectare	Ha	Unit of measurement equivalent to 100 acres.
Highway Authority	HA	The relevant body responsible for the non-core road network (i.e. roads other than trunk roads and motorways), usually the county council in two-tier authority areas.
Highways England	HE	The agency of the Department for Transport responsible for the core road network in England (formerly the Highways Agency).
Hinckley National Rail Freight Interchange	HNRFI	
Historic England	EH	The executive non-departmental public body that advises the public and other bodies on the care of the historic environment in England.
Historic Environmental Record	HER	The record held by the local planning authority of known archaeological sites, buildings and landscapes of relevance to the historic environment.
Historic Landscape Characterisation	HLC	
Home and Communities Agency	HCA	The government's housing, land and regeneration agency and the regulator of r social housing providers in England.
Housing and Economic Needs Assessment	HEDNA	Report evaluating the future housing needs, the scale of future economic growth and the quantity of land and floorspace required for economic development.
Housing Market Area	HMA	Geographical area beyond administrative boundaries defined by household demand and preferences for all types of housing.

Full Text	Acronym/ Abbreviation	Notes
Hover	-	An otter's day nest or resting site.
Indices of Multiple Deprivation	IMD	An index to measure deprived areas in the wards of English local authorities.
Industrial Emissions Directive	IED	EU Directive on industrial emissions.
Institute of Acoustics	IOA	Professional body for Acoustics, Noise and Vibration professionals.
Institute of Air Quality Management	IAQM	IAQM is a professional body for air quality professionals.
Institute of Environmental Management and Assessment	IEMA	IEMA is a professional body for environmental professionals that provides industry guidance on many topics including EIA.
Integrated Pollution Prevention and Control Directive	IPPC	The EU Directive (2008/1/EC) incorporated into UK law by the Environmental Permitting Regulations on prevention and control of industrial emissions. The Directive aims to achieve a high level protection of the environment through measures to prevent or, where that is not practicable, to reduce emissions to air, water and land from activities listed in Annex I of the Directive.
ISO 9613-2	-	Acoustics- Attenuation of sound during propagation outdoors – Part 2: General method of calculation.
Job Seekers Allowance	JSA	Unemployment benefit claimed while looking for work.

Full Text	Acronym/ Abbreviation	Notes
Joint Nature Conservation Committee	JNCC	The public body that advises the UK government and devolved administrations on UK-wide and international nature conservation.
Kilovolt	kV	A measure of electrical potential.
LA10	-	A-weighted noise level exceeded for 10% of the measurement period.
LA90	-	A-weighted noise level exceeded for 90% of the measurement period.
LAeq	-	A-weighted equivalent continuous sound level.
LAmax	-	A-weighted maximum sound pressure level recorded over a given period.
Landscape Character Area	LCA	Identified in the Blaby District Character Assessment 2008
Landscape Character Assessment	LCA	An assessment used to understand and articulate the character of a landscape, by identifying what give a locality it's 'sense of place' and what makes it different from neighbouring areas carried out pursuant to the Landscape Character Assessment Guidance for England and Scotland.
Landscape Character Types	LCT	Identified in the Blaby District Character Assessment 2008
Landscape Character Assessment Guidance for England and Scotland	LCAG	Guidance on Landscape Character Assessment issued by The Countryside Agency (now Natural England) and Scottish Natural Heritage dated 2002.

Full Text	Acronym/ Abbreviation	Notes
Land Plan	-	The plan showing the land required for the Scheme which is to be the subject of the power to acquire new rights, to extinguish or suspend existing rights and/or impose restrictive covenants submitted with the Application (Document Reference 2.2).
Lead	Pb	
Lead Local Flood Authority	LLFA	The authority responsible for developing, maintaining and applying a strategy for local flood risk management in their areas and maintaining a register of flood risk assets.
Leakage	-	The proportion of outputs that benefit those outside of the intervention's target area.
Leicester and Leicestershire 2050: Our Vision for Growth	LL 2050	
Leicester and Leicestershire Enterprise Partnership	LLEP	Strategic body led by a Board or local government and business leaders as well as senior education and third party representatives formed in May 2011.
Leicester and Leicestershire Housing, Planning and Infrastructure Group	HPIG	
Leicester and Leicestershire Strategic Distribution Sector Study Final Report	LLSDSS	Technical report prepared by the HPIG
Leicester and Leicestershire Enterprise Partnership's Strategic Economic Plan	LLEP's SEP	Overarching growth strategy that sets out how we intend to bring together our European Structural and Investment Fund (ESIF) Strategy, City Deal and our Growth

Full Text	Acronym/ Abbreviation	Notes
		Deal to build on LLEP's competitive advantages and tackle the major risks to our economy.
Leicestershire Local Transport Plan 3	LTP3	Strategic framework for transport planning and policy.
Leicestershire and Rutland Environmental Records Centre	LRERC	
Light Goods Vehicle	LGV	Vehicles with a gross weight less than 3.5 tonnes.
Listed Building		A building that has been placed on the statutory list of buildings of Special Architectural or Historic Interest and protected by the Planning (Listed Building and Conservation Areas) Act 1990 (as amended).
Local Air Quality Management Technical Guidance	LAQM TG	
Local Development Framework	LDF	A spatial planning strategy introduced by the Planning and Compulsory Purchase Act 2004.
Local Enterprise Partnership	LEP	A voluntary partnership between local authorities and businesses responsible for setting strategic direction and implementation of economic development.
Local Nature Reserve	LNR	Statutory designation for places with wildlife or geological features that are of special interest locally.
Local Transport Plan	LTP	A plan by a local Highway Authority that sets out a strategy for the future of transport in its area.

Full Text	Acronym/ Abbreviation	Notes
Local Wildlife Site	LWS	Wildlife rich sites selected for their local nature conservation value.
Lowest Observed Adverse Effect Level	LOAEL	Noise
Made Ground	-	Man-made deposits artificially placed comprising a wide variety of material e.g. concrete, brick etc - typical of previously developed sites.
Maintenance	-	Maintenance can comprise inspections, repair, adjustments or alterations, removal, refurbishments, reconstruction, replacements and improvements.
Manual for Streets	MfS	The guidance produced by the Department for Transport and Department for Communities and Local Government on road layout and balancing the needs of different road users, with a focus on residential roads.
Ministry of Housing, Communities and Local Government (formerly Department for Communities and Local Government)	MHCLG	
Multi Agency Geographical Information for the Countryside	MAGIC	A web-based mapping browser showing various geographical designations e.g. nature conservation sites, heritage sites.
Multiplier effects	-	Further economic activity (jobs, expenditure or income) associated with additional expenditure and supplier purchases.
National Air Quality Objectives	NAQOs	

Full Text	Acronym/ Abbreviation	Notes
National Character Area	NCA	Distinct natural areas of England, defined by a unique combination of landscape, biodiversity, geodiversity and cultural and economic activity.
National Cycle Network	NCN	A network of signed and promoted cycle routes across the UK.
National Grid Company	NGC	National Grid's principal operations are the ownership and operation of regulated electricity and gas infrastructure networks.
National Monuments Record	NMR	Currently known as English Heritage Archive.
National Nature Reserve	NNR	Statutory designations, where places with wildlife or geological features that are significant at a national level.
National Planning Policy Framework	NPPF	The National planning policy framework for England.
National Planning Practice Guidance	NPPG	The Planning Practice Guidance web based resource for England first introduced in March 2014 (and which largely superseded planning policy statements (PPSs)) providing guidance on National planning policy and the operation of the planning system.
National Policy Statements	NPS	Overarching legislative policy concerning the planning and consenting of NSIPs in the UK.
Nationally Significant Infrastructure Project	NSIP	As defined by the Planning Act 2008.
National Air Traffic Control Services	NATS	-

Full Text	Acronym/ Abbreviation	Notes
Natural England	NE	The non-departmental government body responsible for England's natural environment.
Nitrate Vulnerable Zone	NVZ	A designated area where land drains into and contributes to nitrate found in nitrate-polluted waters.
Nitrogen Dioxide	NO_2	
Nitrous oxides	NOx	
Noise Policy Statement for England	NPSE	Policy that sets out the long term vision of government noise policy.
Noise Sensitive Receptor	NSR	Receptors principally residential dwellings (existing or for which planning consent is being sought/ has been given) and any building used for long term residential purposes (such as nursing home).
Non-Technical Summary	NTS	The non-technical summary of the Environmental Statement.
Northampton Gateway Rail Freight Interchange	NGRFI	
Okta	-	A unit used in expressing the extent of cloud cover, equal to one eighth of the sky.
Operation	-	The routine day to day functioning of the Proposed Development.

Full Text	Acronym/ Abbreviation	Notes
Order	-	The Development Consent Order (DCO).
Order Land	-	The land shown on the Land Plan which is within the Order Limits.
Order Limits	-	The limits shown on the Works Plans within which the Scheme may be carried out.
Ordnance Survey	OS	National mapping agency for Great Britain
Otter Faeces	Spraint	
Overhead Line	OHL	Network of overhead electricity transmission lines
Ozone	O_3	
Part II A	-	The section of EPA 1990 that deals with contaminated land.
Annual Average Flow Rate for surface water runoff	QBAR	-
Particulate Matter	PM	Very small solid particles.
Pathway	-	The route by which contamination moves from a source to a given receptor.

Full Text	Acronym/ Abbreviation	Notes
Peak Particle Velocity	PPV	A term used to measure vibration through a solid surface. When a vibration is measured, the point at which the measurement takes place can be considered to have a particle velocity.
PEIR site boundary		The site boundary identified for environmental survey purposes within the Preliminary Environmental Information Report.
Percentage Heavy Goods Vehicles	%HGV	Percentage of traffic that is classified as Heavy Goods Vehicles in a 16hr period.
Permitted Development	-	Development that is deemed under legislation to have planning consent without the need to obtain planning permission.
Personal Protective Equipment	PPE	Equipment a person may wear to protect themselves from risks e.g. high-visibility jackets, gloves, steel toe capped boots.
Planning Act 2008	PA 2008	England and Wales legislation which established the legal framework to apply for, examine and determine applications for Nationally Significant Infrastructure Projects.
Planning Inspectorate	PINS	Executive agency supported by the Department for Communities and Local Government which deals with planning appeals, national infrastructure, planning applications, examinations of local plans and other planning related and specialist casework in England and Wales.
Pollution Prevention Guidance	PPG	Environment Agency published guidance on pollution prevention and best practice.
Potential Contaminant Linkages	PCL	The existence of a contamination source and a receptor where a pathway is also present linking the two.

Full Text	Acronym/ Abbreviation	Notes
Potential Local Wildlife Sites	pLWS	Wildlife rich sites with potential to be selected for their local nature conservation value.
Preliminary Environmental Information Report	PEIR	A report describing the preliminary environmental assessment during the pre-application process of an NSIP.
Protection of Badgers Act 1992	-	
Public Right of Way	PRoW	Paths on which the public have legally protected rights to pass.
Rail Bridge 104	-	The bridge known Railway Bridge 104 crossing the West Coast Mainline Railway at Grid reference SJ 891 371.
Rail Terminal		Location within the Main HNRFI Site where trains terminate
Receptor	-	An identified aspect of the environment - e.g. a resident, protected species, heritage asset, controlled water etc - that may be affected by the Scheme and, as such, has been assessed as part of the EIA undertaken.
Regional Distribution Centre	RDC	
Registered Parks and Gardens	-	Gardens and designed landscapes of special architectural and historic importance, placed on a national register by English Heritage.
Remediation	-	The clean-up of contaminated soil to make it suitable and safe for future use.
Resource Management Plan	RMP	

Full Text	Acronym/ Abbreviation	Notes
River Basin Management Plan	RBMP	A management tool created by Environment Agency to use for integrated water resources management.
Scheduled Ancient Monument	SAM	A nationally important archaeological site or historic building, protected under the Ancient Monuments and Archaeological Areas Act 1979.
Scoping Opinion	-	The Scoping Opinion provided by the Secretary of State.
Secretary of State	SoS	The decision maker for a NSIP application and head of the relevant government department.
Significant Observed Adverse Effect Level	SOAEL	Noise
Simulation and Assignment of Traffic to Urban Road Network	SATURN	Traffic model incorporated in Leicester and Leicestershire Integrated Transport Model
Site of Nature Conservation Interest	SNCI	Non-statutory areas of local importance for nature conservation.
Site of Special Scientific Interest	SSSI	A geological or biological conservation designation denoting a protected area in the UK.
Site Waste Management Plan	SWMP	The strategic document dealing with the effective management of materials used for the construction and the operation of the Scheme ensuring that waste is considered at all stages of the Scheme.
Soil Guideline Values	SGV	Scientifically based generic assessment criteria that can be used to simplify the assessment of human health risks arising from long-term and on-site exposure to chemical contamination in soil.

Full Text	Acronym/ Abbreviation	Notes
Sound Power Level	SWL	The Sound Energy flow per unit of time.
Sound Pressure Level	SPL	Logarithmic measure of the sound pressure of a sound relative to a reference value, the threshold of hearing.
Special Area of Conservation	SAC	Area of protected habitats and species as defined in the European Union's Habitat Directive (92/43/EEC).
Special Landscape Areas	SLA	Local designation to provide protection for locally significant and attractive landscapes.
Special Protection Area	SPA	A designated area for birds under the European Union Directive on the Conservation of Wild Birds (2009/147/EC)
Square feet	Sqft	Unit of area
Square metres	Sqm	Unit of area
Statement of Common Ground	SoCG	A written statement providing the commonly understood basis for the appellant and local authority or other interested party.
Statement of Community Consultation	SoCC	A statement describing how an applicant proposes to consult the local community about a project.
Strategic Rail Freight Interchange	SRFI	Large multi-purpose freight interchange and distribution centre linked to both the rail and trunk road systems.
Sustainable Drainage Systems	SuDS	Drainage solutions that provide an alternative to the direct channelling of surface water through networks of pipes and sewers to nearby watercourses

Full Text	Acronym/ Abbreviation	Notes
Transport Analysis Guidance	TAG	Guidance from the Department for Transport on how to assess transportation schemes.
Transport Assessment	TA	
Tree Preservation Order	TPO	A written order made by the local authority which makes it an offence to intentionally damage or remove a tree protected by that order without the authority's permission.
UK Climate Projections	UKCP	
Unacceptable Adverse Effect Level	UAEL	Noise
Unemployment	-	All people aged 16+ without a job who were available to start work in the two weeks following their interview and who had either looked for work in the four weeks prior to interview or were waiting to start a job they had already obtained.
United Nations Economic Commission for Europe	UNECE	Organisation providing medical and scientific evidence of health risks to the general public and recommended concentration limits.
Valuation Office Agency	VOA	Executive agency of Her Majesty's Revenue and Customs. The Agency values properties for the purpose of Council Tax and for non-domestic rates in England and Wales.
Waste (England & Wales) Regulations 2011	-	Legislation concerning waste prevention and the management and introduction of waste hierarchy. The regulations apply to England and Wales only.
Water Framework Directive	WFD	The Water Framework Directive is a European Union directive which commits EU member states to achieve good qualitative and

Full Text	Acronym/ Abbreviation	Notes
		quantitative status of all water bodies.
Water Resources Act 1991	WRA	Legislation to prevent and minimise pollution of water.
Weighted Sound Reduction Index	Rw	Single-number quantity which characterises the airborne sound insulation of a material or building element over a range of frequencies when tested in a laboratory.
West Coast Mainline	WCML	
Wild Mammals (Protection) Act 1996	-	
Wildlife and Countryside Act 1981	-	Legislation which protects animals, plants and certain habitats in the UK.
World Health Organisation	WHO	A United Nations agency concerned with public health.
Works Plans	-	The plans showing the numbered Works referred to in the Order and submitted with the Application (Document Reference 2.3).
Zone of Influence	ZOI	The primary impact area surrounding the development Site defined as the area within commuting distance of the proposed development.
Zone of Theoretical Visibility	ZTV	A computer generated plan showing a maximum area of the surroundings within which a project could theoretically be viewed.

Tritax Symmetry (Hinckley) Limited

HINCKLEY NATIONAL RAIL FREIGHT INTERCHANGE

Preliminary Environmental Information Report

Chapter 1: Introduction

January 2022

This document forms a part of a Preliminary Environmental Information Report (PEIR) for the Hinckley National Rail Freight Interchange project.

A PEIR presents environmental information to assist consultees to form an informed view of the likely significant environmental effects of a proposed development and provide feedback.

This PEIR has been prepared by the project promoter, Tritax Symmetry (Hinckley) Limited. The Proposed Development is described in Chapter 3 of the PEIR and is the subject of a public consultation running from 12 January to 9 March 2022.

Details of how to respond to the public consultation are provided at the end of Chapter 1 of the PEIR and on the project website:

http://www.hinckleynrfi.co.uk/

This feedback will be taken into account by Tritax Symmetry (Hinckley) Limited in the preparation of its application for a Development Consent Order for the project.

Chapter 1 ◆ Introduction

BACKGROUND

1.1. Tritax Symmetry (Hinckley) Limited ('TSH' or 'the Applicant') is promoting proposals for a new strategic rail freight interchange (SRFI) on land east of Hinckley, in Blaby District in Leicestershire. TSH is a subsidiary of Tritax Symmetry Limited, an established property development company with a portfolio of logistics floorspace across the UK. Further details on TSH and Tritax Symmetry Limited are set out below.

1.2. A SRFI is a multi-purpose freight interchange and distribution centre linked to both the national rail and road networks. SRFIs reduce the cost of moving freight and encourage the transfer of freight from road to rail. Under the Planning Act 2008, the SRFI proposals qualify as a Nationally Significant Infrastructure Project (NSIP) as they comprise a rail freight interchange as described in section 26 of the Planning Act 2008. In accordance with the Act, an application for a Development Consent Order (DCO) will be submitted in 2022 to the Planning Inspectorate (PINS), which will examine the DCO application on behalf of the Secretary of State for Transport.

1.3. To help inform the determination of the DCO application, the Applicant is undertaking an environmental impact assessment (EIA) of its proposals. EIA is a process that aims to improve the environmental design of a development proposal, and to provide the decision maker with sufficient information about the environmental effects of the project to make a decision.

1.4. The findings of an EIA are described in a written report known as an Environmental Statement (ES). An ES provides environmental information about the scheme, including a description of the development, its predicted environmental effects and the measures proposed to ameliorate any adverse effects. The Applicant will submit an ES with its DCO application.

1.5. Extensive public consultation is required before a DCO application can be submitted. The Applicant undertook an informal public consultation in autumn 2018. Consultation feedback highlighted concern about the effects of the proposed development on local road traffic, particularly as a result of the proposed upgrade of Junction 2 of the M69 motorway, which would redistribute existing traffic flows on the local road network. In response, the Applicant carried out a further informal consultation in summer 2019 on off-site highway improvements.

1.6. In January 2022 the Applicant commenced a statutory consultation on the DCO application, including the SRFI, upgrades to M69 Junction 2 and other off-site highway improvements. These off-site highway improvements include a new road link between M69 Junction 2 and the B4668/A47 Leicester Road to the west of the proposed SRFI (referred to as the A47 Link Road) and minor junction improvements elsewhere. The

project will also require the closure of a section of Burbage Common Road and pedestrian level crossings and entail the diversion of some existing public rights of way.

1.7. The draft 'Order Limits', which define the area in which the proposed SRFI Site and related road and rail infrastructure development would take place, are shown in figures 1.1 and 1.2 of this report. The Order Limits are broadly comparable to the red line boundary in a planning application.

1.8. As explained in more detail later in this chapter, the purpose of the current report is to present environmental information compiled by the Applicant to enable consultees to develop an informed view of the likely significant environmental effects of the proposed development and provide feedback. The report is known as a Preliminary Environmental Information Report (PEIR). The Applicant will take the consultation feedback into account when finalising its proposal prior to the submission of the DCO application.

1.9. This PEIR is structured along the same lines as an ES. However, for the avoidance of doubt the information it contains is 'preliminary'. The Applicant is actively seeking consultees' comments and there will be the opportunity for amendments to both the design of the proposed development and the EIA to take into account comments received through this consultation, prior to final submission.

PROJECT OVERVIEW

1.10. The Proposed Development is an SRFI and is known as the Hinckley National Rail Freight Interchange (HNRFI or 'the Project'). The general purpose of the Proposed Development is explained in paragraph 2.44 of the Department for Transport's *National Policy Statement for National Networks* (NPS, December 2014, page 20):

'The aim of a strategic rail freight interchange (SRFI) is to optimise the use of rail in the freight journey by maximising rail trunk haul and minimising some elements of the secondary distribution leg by road, through co-location of other distribution and freight activities. SRFIs are a key element in reducing the cost to users of moving freight by rail and are important in facilitating the transfer of freight from road to rail, thereby reducing trip mileage of freight movements on both the national and local road networks'.

1.11. The essential components of a SRFI development include direct rail connections to ports at which freight is imported and exported, and high quality strategic rail and road connections to the region or regions that the interchange will serve. An SRFI also requires a substantial area of broadly level and free-draining land for storage and logistics buildings and associated road haulage yards. It must also satisfy the criteria of the Planning Act set out at paragraph 1.20 below.

1.12. These requirements are all met by the proposed site for the HNRFI. The Site lies 3 km to the north-east of Hinckley, in a level area of mixed farmland to the north-west of M69 Junction 2. The railway between Leicester and Hinckley on the north-western boundary of the site is on Network Rail's strategic freight network, linking the west coast and east coast main lines and forming a primary link between Felixstowe and the Midlands and

North. Network Rail has already undertaken substantial capacity enhancements under its Felixstowe to Nuneaton freight capacity scheme (F2N).

1.13. The draft DCO Order Limits include the land between the Leicester to Hinckley railway and the M69 motorway to the south of Elmesthorpe, where the proposed SRFI would be located. This area is referred to as the 'Main HNRFI Site'. The draft DCO Order Limits also include contiguous extensions to the north-west, south and east of the Main HNRFI Site, respectively to contain the corridor of a proposed A47 Link Road, proposed works to M69 Junction 2 and a section of the B4669 Hinckley Road towards the village of Sapcote for which proposed traffic management measures are proposed.

1.14. The draft Order Limits also include additional non-contiguous areas of land at roads and junctions for which highway enhancements and traffic management measures are proposed. They also include some pedestrian level crossings on the Leicester to Hinckley railway that are subject to proposed works and restrictions.

1.15. The HNRFI includes the following main elements.

The 'Main HNRFI Site'

Railport

- Railway sidings and a freight transfer area known as a 'Railport' are proposed alongside the existing two-track railway between Leicester and Hinckley, which is on Network Rail's strategic rail freight route between Felixstowe and Nuneaton. For this reason and more generally because of its central location between the west coast and east coast main lines, the HNRFI would enjoy good rail connections with the sea ports of Felixstowe, London Gateway and Liverpool, and is also well-placed in the national rail network to provide direct links to and from major cargo terminals at Southampton and the Humber estuary.

Warehousing

- Two plateaux bound by the Railport to the north-west and the M69 motorway to the south-east, for the development of high-bay use class B8 (warehouse or distribution) buildings. These B8 buildings will have a total area of up to 850,000 square metres gross internal area (GIA), comprising up to 650,000 square metres at ground level and up to 200,000 square metres of internal mezzanine floorspace [1]). These buildings will be up to a maximum of 33 metres in height above ground level although it is not envisaged that entire buildings will be this high. The proposed maximum building height would allow the scheme to accommodate modern automation systems and occupiers requiring high bay racking.

[1] *A mezzanine floor is an intermediate level built between the main floor and ceiling of a double-height building. A mezzanine floor does not extend across the whole area of the building and might have partly open sides. In B8 logistics buildings, mezzanine floors are often used to provide ancillary office space and staff facilities and/or additional storage space.*

Highway works

M69 Junction 2

- A new road access to the HNRFI would be added to the existing roundabout at M69 Junction 2. The M69 motorway connects the M6 near Coventry to the M1 near Leicester and has links to the A5 in between. As a part of the proposals, a northbound off-slip and a southbound on-slip would be added to M69 Junction 2, which currently caters only for M69 motorway traffic heading to and from the north.

A47 Link Road

- A link road from M69 Junction 2 to the B4668/A47 Leicester Road, including the demolition of an existing railway bridge and construction of a replacement bridge to provide a new highway. Access to the B8 buildings and Railport on the Main HNRFI Site will be taken from the A47 Link Road. That part of the A47 Link Road that lies between the existing roundabout at M69 Junction 2 and the railway lies within the Main HNRFI Site.

Minor enhancement works

- Minor enhancement works at ten other junctions in the locality, as identified in Chapter 3: *Project description* and Chapter 8: *Transport and traffic* of this PEIR.

Other works

- Landscape and planting works, ecological mitigation, drainage, a heavy goods vehicle parking area with driver welfare facilities and a HGV fuel station, an energy centre, a building providing offices and a marketing suite, and footpath, cycleway and bridleway routes and connections.

- Works and closures to a series of local pedestrian level crossings on the Leicester to Hinckley railway.

1.16. The Main HNRFI Site lies wholly within Blaby District in Leicestershire. The M69 motorway works are also located in Blaby District. The A47 Link Road extends into Hinckley and Bosworth Borough. The proposed off-site highway enhancement works are in Blaby District, Hinckley and Bosworth Borough, Rugby Borough and Harborough District.

THE APPLICANT

1.17. Tritax Symmetry Limited was formed following the acquisition of db symmetry by Tritax Big Box REIT plc, a FTSE 250 company, in February 2019. Tritax Big Box REIT plc is a real estate investment trust (REIT) dedicated to investing in and funding the pre-let development of very large logistics facilities in the UK.

1.18. Tritax Symmetry Limited has a land portfolio of 1,680 hectares (ha) 4,150 acres), capable of accommodating 3.7 million sq. metres (40 million sq. ft) of logistics space. The portfolio is concentrated around the main motorway arteries of the UK and primarily along the M1 and M40 motorways in the Midlands and in the north-west's M6 and M62 motorway corridors.

1.19. TSH is a group company and was established for the purpose of promoting the HNRFI.

THE DEVELOPMENT CONSENT ORDER PROCESS

1.20. The Planning Act 2008 introduced a bespoke approval process for nationally significant infrastructure projects (NSIPs), which include a range of transport, energy, waste and water proposals. Instead of applying to the local planning authority for planning permission, qualifying infrastructure providers apply for a Development Consent Order (DCO) from the government.

Criteria for qualification as an NSIP

1.21. The Proposed Development qualifies as an NSIP under Section 26 of the Planning Act 2008 (as amended). The qualifying criteria are that the project must:

- be a part of the railway network in England;
- be at least 60 ha in area;
- be capable of handling consignments of goods from more than one consignor and to more than one consignee, and at least four goods trains per day; and
- include warehouses to which goods can be delivered from the railway network in England either directly or by means of another form of transport.

1.22. The Project meets all of these criteria and the Applicant will therefore be applying for a DCO, the nature of which is explained below.

Development Consent Orders

1.23. A DCO is a 'Statutory Instrument'. Statutory Instruments (SIs) are a form of legislation that allow the provisions of an Act of Parliament to be brought into force or altered without Parliament having to pass a new Act. They are also referred to as secondary, delegated or subordinate legislation.

1.24. A DCO can include a range of powers beyond a conventional planning permission. These include rights to undertake street works, identify landowners, enter land for surveys, remove or undertake works to protected trees and hedgerows, override easements, discharge water, etc. It can include 'Protective Provisions' that define how existing utilities infrastructure will be maintained during the development. A DCO can grant rights to compulsorily purchase land, extinguish private rights over land or impose

restrictive covenants. It can also include a wide range of 'Associated Development', which may be off-site (outside the Order Limits) but which is necessary to help deliver the main development.

1.25. The DCO application process is 'front-loaded' meaning it requires extensive pre-application consultation and design refinement prior to submission. Once submitted and accepted, applications are administered by the Planning Inspectorate (PINS or 'the Examining Authority') in accordance with a timetabled process. The process provides extensive scope for public and local authority engagement. After a six-month examination of a DCO application, the Examining Authority has three months to report its findings to the relevant Secretary of State – in this case, the Secretary of State for Transport. The Secretary of State then has a further three months in which to decide whether to 'make' (i.e. approve) the DCO.

National Policy Statements

1.26. DCO applications are determined in accordance with National Policy Statements (NPS) approved by Parliament. The NPS for National Networks (Department for Transport, December 2014) includes a clear acknowledgement of the national need for SRFI development. The NPS can be viewed via the following weblink:

https://www.gov.uk/government/publications/national-policy-statement-for-national-networks

ENVIRONMENTAL IMPACT ASSESSMENT

The need for EIA

1.27. EIA for NSIP developments is undertaken in accordance with the Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 ('the EIA Regulations'). Regulation 6 determines development to be 'EIA development' if any of the following circumstances apply:

- the applicant notifies the Secretary of State in writing under regulation 8(1)(b) that it proposes to provide an ES in respect of proposed development; or
- the Secretary of State or an Examining Authority adopts a screening opinion to the effect that the development is EIA development; or
- the Secretary of State directs an accepted application to be EIA development.

1.28. Schedule 2 of the EIA Regulations identifies the types of development that might require ES if likely to have significant effects on the environment by virtue of factors such as their nature, size or location. The Proposed Development is included in the following parts of Schedule 2 of the EIA Regulations:

- Part 10(a) 'Industrial estate development projects';

- Part 10(c) 'construction of intermodal transhipment facilities and of intermodal terminals';
- Part 10(d) 'construction of railways'; and
- Part 10(f) 'construction of roads'.

1.29. Following consideration of the characteristics of development, the location of development and the types and characteristics of potential impacts, the Applicant concluded that its proposals are EIA development and volunteered to provide an ES to accompany the application for a DCO. The Applicant has notified the Secretary of State in writing under regulation 8(1)(b) that it proposes to provide an ES in respect of the Project.

The scope of the EIA

1.30. On 14 March 2018 the Applicant requested an EIA scoping opinion from the Secretary of State for Transport under Regulation 10 of the EIA Regulations. A scoping opinion request seeks the decision maker's written confirmation of the scope of the EIA. The request was accompanied by the Applicant's ES scoping report entitled *'Hinckley National Rail Freight Interchange: application for an EIA scoping opinion'*. This report set out the Applicant's considered views on likely significant environmental effects and the scope of information the Applicant considered was appropriate to assess the environmental effects of the scheme. A weblink to this report is provided below.

https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/TR050007/TR050007-000010-HRFI%20-%20Scoping%20Report.pdf

1.31. On 24 April 2018 PINS issued the Secretary of State's response, entitled *Scoping Opinion - Proposed Hinckley National Rail Freight Interchange 2018*. A weblink to this scoping opinion is provided below.

https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/TR050007/TR050007-000023-HRFI%20-%20Scoping%20Opinion.pdf

1.32. Subsequent assessment of the effects by the Applicant of the Proposed Development on road traffic indicated that the scope of the ES needed to be extended. In particular, transport modelling suggested that the proposed upgrade of M69 Junction 2 would change patterns of existing non-HNRFI-related road traffic in the locality, creating new routes on the local road network with consequential environmental effects. In response the Applicant submitted an updated ES scoping request on 12 November 2020. A new ES scoping opinion was adopted by the Secretary of State on 22 December 2020 (the 2020 Scoping Opinion). Weblinks to both documents are provided below, and later chapters of this PEIR explain how TSH is taking the new scoping opinion into account in its ES.

https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/TR050007/TR050007-000062-HRFI%20-%20Scoping%20Report.pdf

https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/TR050007/TR050007-000055-HRFI%20-%20Scoping%20Opinion.pdf

THE EIA PROCESS AND THE PEIR

1.33. PINS has published a series of advice notes to guide the preparation and examination of DCO applications. *Advice Note Seven: Environmental Impact Assessment: Process, Preliminary Environmental Information and Environmental Statements* (version 7, June 2020) explains in paragraph 9.3 that PINS considers a good ES to be one that:

- *provides a clear description of the Proposed Development through all phases of the development consistent with the DCO - i.e. in terms of construction, operation and decommissioning phases;*
- *clearly explains the processes followed to develop the ES including the established scope for the assessment;*
- *explains the reasonable alternatives considered and the reasons for the chosen option taking into account the effects of the Proposed Development on the environment;*
- *details the forecasting methods for the assessment and the limitations (as relevant);*
- *assesses in an open and robust way the assessment of likely significant effects explaining where results are uncertain;*
- *provides sufficient details of the measures envisaged to prevent, reduce and where possible offset any significant adverse effects, the likely efficacy of such measures and how they are secured;*
- *details the need for any ongoing monitoring or remediation; and*
- *demonstrates that the information is sufficient to enable a reasoned conclusion to be reached.*

1.34. In respect of the PEIR, para. 8.4 of Advice Note 7 states that:

'There is no prescribed format as to what PEI should comprise and it is not expected to replicate or be a draft of the ES. However, if the Applicant considers this to be appropriate (and more cost-effective) it can be presented in this way. A good PEI document is one that enables consultees (both specialist and non-specialist) to understand the likely environmental effects of the Proposed Development and helps to inform their consultation responses on the Proposed Development during the pre-application stage'.

1.35. The Applicant has taken Advice Note 7 into account in the production of the current PEIR, which takes the form of a draft of the ES based on the environmental information currently available to the Applicant. The standard structure of an ES will be familiar to

statutory consultees and provides clear signposting to individual environmental topics of interest to local communities.

THE ROCHDALE ENVELOPE

1.36. The ES for the Project will be undertaken in accordance with what are known as 'Rochdale Envelope' principles in reflection of the fact that the DCO will need to retain flexibility around the internal layout and design of the HNRFI [2]. Broadly, this means that the DCO application will be similar in concept to an application for outline planning permission. The DCO application will fix the outer envelope or 'parameters' of the Proposed Development including its position, land uses and the overall maximum dimensions of built features such as buildings, roads and landscape areas. If the DCO is made, the Applicant will be required to submit details of individual buildings and development phases to Blaby District Council or Hinckley and Bosworth Council for approval prior to construction of those elements. These design details would be within the assessed and approved parameters.

1.37. The EIA Regulations require that the development parameters must be identified with sufficient precision so that their likely significant environmental effects can be defined and assessed. Paragraph 2.4 of PINS *Advice Note 9: Using the Rochdale Envelope* (version 3, July 2018) identifies the guiding principles for the use of the Rochdale Envelope as follows:

- *'the DCO application documents should explain the need for and the timescales associated with the flexibility sought and this should be established within clearly defined parameters;*
- *the clearly defined parameters established for the Proposed Development must be sufficiently detailed to enable a proper assessment of the likely significant environmental effects and to allow for the identification of necessary mitigation, if necessary, within a range of possibilities;*
- *the assessments in the ES should be consistent with the clearly defined parameters and ensure a robust assessment of the likely significant effects;*
- *the DCO must not permit the Proposed Development to extend beyond the 'clearly defined parameters' which have been requested and assessed. The Secretary of State may choose to impose requirements to ensure that the Proposed Development is constrained in this way;*

[2] *The Rochdale Envelope approach originated in two court decisions in 1999 and 2000, in which it was established that a planning application for a development requiring EIA could be made in outline provided that sufficient design detail was provided to inform a reliable assessment of environmental effects in accordance with the EIA Regulations. The court decisions concerned a planning application for a business park in Rochdale.*

- *the more detailed the DCO application is, the easier it will be to ensure compliance with the Regulations'.*

The need for flexibility

1.38. The flexibility implicit in the Rochdale Envelope approach is essential for the HNRFI Project for the following reasons.

- The needs of the freight logistics industry are rapidly evolving and the sector is in the midst of a technical revolution. Given the envisaged 15-year timeframe for the full delivery of the HNRFI, it is essential that the DCO affords sufficient flexibility to accommodate developments in rail and road transport, freight handling and storage, construction methods, energy supply, employees' transport arrangements, etc.

- There is a need to cater for the requirements of individual logistics occupiers – particularly with respect to the dimensions of individual buildings and freight handling areas.

THE PROJECT TEAM

1.39. Table 1.1 identifies the team that TSH has appointed to progress the DCO application for the HNRFI. The consultants, and the sub-consultants and individuals that are assigned to the Project constitute 'competent experts' for the purpose of Regulation 14(4)(a) of the EIA Regulations.

Table 1.1: The consultant team appointed by the Applicant to progress the HNRFI project

Specialism	Consultant
Legal	**Eversheds Sutherland (International) LLP**, 115 Colmore Row, Birmingham B3 3AL
Planning	**Framptons**, Oriel House, 42 North Bar, Banbury Oxfordshire OX16 0TH
ES coordination	**Savills**, 33 Margaret Street, London W1G 0JD
Socio-economic effects	
Land referencing	**Terraquest,** Quayside Tower, 252-260 Broad Street, Birmingham, B1 2HF
Transport and traffic	**BWB Consulting ('BWB')**, 5th Floor, Waterfront House, Station Street, Nottingham, NG2 3DQ
Air quality	
Noise and vibration	
Surface water and flood risk	
Hydrogeology	
Geology, soils and contaminated land	
Energy and climate change	
Materials and waste	**Capita Real Estate and Infrastructure,** 65 Gresham Street, London EC2V 7NQ
Landscape and visual effects	**The Environmental Dimension Partnership ('EDP')**, Tithe Barn, Barnsley Park Estate, Barnsley, Cirencester, Gloucestershire GL7 5EG
Ecology and biodiversity	
Cultural heritage	
Community engagement	**Lexington Communications**, 198 High Holborn, London WC1V 7BD
Architects	**AJA Architects**, Elliot Court, 1170 Herald Ave, Coventry CV5 6UB
Strategic rail advisor	**Baker Rose Consulting**, 53 Davies Street, London W1AK 5JH
Railway engineers	**WSP Parsons Brinckerhoff**, 1 Queens Drive, Birmingham B5 4PJ
Utilities adviser	**RPS Planning and Development**, Sherwood House, Sherwood Avenue, Newark, Nottinghamshire NG24 1QQ
Quantity surveyor	**Feasibility Limited**, No. 5 Hagley Court North, The Waterfront, Level Street, Brierley Hill DY5 1XF

CONSULTATIONS

1.40. Section 47 of the Planning Act 2008 places a duty upon applicants to engage meaningfully with affected communities, local authorities and other statutory consultees over their proposals at the pre-application stage. An explanation of how the Applicant is consulting with interested parties is set out in a Statement of Community Consultation (SoCC, updated in December 2021), a weblink to which is provided below.

https://www.hinckleynrfi.co.uk/formal-consultation/

1.41. The SoCC explains how TSH is fulfilling its obligations to consult the local community. The Applicant is also consulting with landowners and the holders of land rights, in accordance with Sections 42-44 of the Planning Act 2008, and will further publicise the consultation as required under section 48 of the Planning Act 2008.

THIS REPORT

1.42. In accordance with Regulation 12(2) of the EIA Regulations, the purpose of this PEIR is to present environmental information compiled by the Applicant that will assist consultees to develop an informed view of the likely significant environmental effects of the development. The PEIR is arranged as follows.

- ***Chapter 2*** describes the proposed site of the HNRFI, including its location in the East Midlands, the site and its surroundings.

- ***Chapter 3*** provides a description of the proposed development. It begins with an explanation of the purpose of SRFIs and then describes the proposed rail and road connections, the logistics park and arrangements for landscape, planting and public rights of way. The chapter concludes with a description of how the HNRFI would operate, once built.

- ***Chapter 4*** explains the considerations that informed the selection of the proposed site for the HNRFI, and outlines other options that were considered, including 'do nothing', alternative sites and alternative designs.

- ***Chapter 5*** identifies the need for new SRFI capacity as specified in national and county policy. Local planning policy is also summarised.

- ***Chapter 6*** sets out the scope and general methodology of the ES for the project.

- ***Chapters 7 to 19*** provide environmental information about the proposals under the chapter headings listed below.

    7. *Land use and socio-economic effects*
    8. *Transport and traffic*
    9. *Air quality*

10. *Noise and vibration*
11. *Landscape and visual effects*
12. *Ecology and biodiversity*
13. *Cultural heritage*
14. *Hydrogeology*
15. *Surface water and flood risk*
16. *Geology, soils and contaminated land*
17. *Materials and waste*
18. *Energy and climate change*
19. *Major accidents and disasters*

1.43. For each topic the chapters begin with an explanation of the study methods and data sources used and the topic-specific consultations undertaken to date. Baseline conditions including the existing character of the site and surrounding area are then described. The potential environmental effects of the proposals are identified and, where necessary, mitigation is proposed to address any adverse environmental effects. The residual effects of the proposed development with the identified mitigation in place is then described.

1.44. Most of the topic-based chapters are accompanied by technical appendices, identified on the contents page of this PEIR.

1.45. Finally -

- ***Chapter 20*** describes the cumulative and in-combination environmental effects for the project as a whole. Consideration is also given to the 'trans-boundary effects' of the project – the potential for significant environmental effects beyond the UK border.

- ***Chapter 21*** presents the interim conclusions of the PEIR and describes the proposed structure of the ES that will accompany the DCO application for the HNRFI.

1.46. A non-technical summary of the PEIR is also available.

CONTACTS AND FURTHER INFORMATION

1.47. Information about the Proposed Development, including the PEIR and other consultation documents, is available at the following website:

http://www.hinckleynrfi.co.uk/

1.48. Any questions can be directed to the project team in the following ways:

- *e-mail* - hinckleynrfi@lexcomm.co.uk

- *telephone* - 0844 556 3002 (Mon-Fri, 9am-5.30pm)

- *in writing* – Hinckley NRFI Lexington Communications, Third Floor, Queens House, Queen Street, Manchester, M2 5HT.

1.49. A link to the Hinckley National Rail Freight Interchange consultation website is also available on the project's social media platforms as follows:

- *Facebook* / *Meta* - 'Hinckley National Rail Freight Interchange – HNRFI'
- *Twitter* - @HinckleyRail
- I*nstagram* - 'hinckleynationalrailfreight'

Tritax Symmetry (Hinckley) Limited

HINCKLEY NATIONAL RAIL FREIGHT INTERCHANGE

Preliminary Environmental Information Report

Chapter 2: Site description

January 2022

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This PEIR has been prepared by the project promoter, Tritax Symmetry (Hinckley) Limited. The Proposed Development is described in Chapter 3 of the PEIR and is the subject of a public consultation running from 12 January to 9 March 2022.

Details of how to respond to the public consultation are provided at the end of Chapter 1 of the PEIR and on the project website:

http://www.hinckleynrfi.co.uk/

This feedback will be taken into account by Tritax Symmetry (Hinckley) Limited in the preparation of its application for a Development Consent Order for the project.

Chapter 2 ◆ Site description

INTRODUCTION

2.1. This chapter of the PEIR describes the land and surrounding area of the Proposed Development and identifies the principal environmental designations in the locality.

Definitions

2.2. Figure 2.1 shows the boundary of the land within which works are currently proposed. The boundary is shown as a red line and is referred to in this document as the **'draft Order Limits'** or **'the DCO Site'**. The Order Limits are shown in draft because, in the light of consultation feedback and other considerations, the Applicant might amend the boundaries before submitting the DCO application.

2.3. The land between the M69 motorway and the Leicester to Hinckley railway on which the proposed Hinckley National Rail Freight Interchange (HNRFI) would be developed is identified as the **'Main HNRFI Site'**, as shown in Figure 2.1.

2.4. The draft Order Limits that contain the Main HNRFI Site also include contiguous areas to the north-west, south and east, respectively to contain the corridor of a proposed link road that would cross the Leicester to Hinckley railway and connect to the B4668/A47 Leicester Road (the **'A47 Link Road'**), the proposed works to M69 Junction 2 and a section of the B4669 Hinckley Road towards the village of Sapcote. These are called the **'Main Order Limits'** in this PEIR.

2.5. The draft Order Limits also include additional non-contiguous areas of land at roads and junctions for which highway enhancements and traffic management measures are proposed. The Order Limits also include some pedestrian level crossings on the Leicester to Hinckley railway that are subject to proposed works and restrictions.

Local government jurisdictions

2.6. All of the land inside the Main Order Limits is in Blaby District in Leicestershire except for the north-western end of the A47 Link Road corridor, which is in the Borough of Hinckley and Bosworth in the same county. Supporting highway works are proposed in Blaby, Hinckley and Bosworth and Harborough Districts in Leicestershire and in the Borough of Rugby in Warwickshire.

LAND INSIDE THE MAIN ORDER LIMITS

2.7. In detail, the principal elements and features of the land inside the Main Order Limits are as follows.

Railway

2.8. The HNRFI would be situated on the south-eastern side of the railway. The railway has two tracks and for most of its route past the Main HNRFI Site is either at grade or slightly above or below surrounding ground levels. The line is not electrified. Burbage Common Road crosses the railway by means of a single-lane hump-backed bridge.

2.9. The closest passenger stations to the Site are Hinckley, approximately 2.7km to the south-south-west, and at Narborough, approximately 9km to the east-north-east.

2.10. This railway forms part of Network Rail's strategic freight network, linking the west coast and east coast main lines and forming a primary link between Felixstowe and the Midlands and North. Network Rail has already undertaken substantial capacity enhancements under its Felixstowe to Nuneaton freight capacity scheme.

2.11. The Main Order Limits cross the railway and include some land on its north-western side. This is to accommodate works to the railway and Burbage Common Road overbridge, landscape works and the closure of three pedestrian level crossings on the Leicester to Hinckley railway that are scheduled for closure. These level crossings serve footpaths in Elmesthorpe (footpath referenceT89/1) and from the direction of Earl Shilton (footpath references U50/3 and U50/4) and from Barwell (footpath reference V23/1).

Roads

2.12. The Main Order Limits extend across and along a section of the M69 motorway, to the north-east and south-west of M69 Junction 2, in order to include land for a reconfiguration of M69 Junction 2, the addition of a northbound off-slip and a southbound on-slip and temporary construction compounds. This section of the M69 motorway comprises a six-lane dual carriageway with hard shoulders and steel crash barriers.

2.13. M69 Junction 2 comprises an oval roundabout that crosses the motorway on overbridges with the motorway in a cutting. The junction connects the single-carriageway B4669 Hinckley Road east-west route to the M69 motorway by means of a northbound on-slip and a southbound off-slip only, with no slip roads to or from the south. The roundabout encloses areas of woodland on both sides of the motorway.

2.14. The Main HNRFI Site is crossed by Burbage Common Road, a rural lane running between B4668 at Burbage Common and the B581 Station Road near Elmesthorpe. It crosses the central-northern area of the Main HNRFI Site and provides access to Woodhouse Farm and Langton Farm.

2.15. The northern stretch of Burbage Common Road, connecting the proposed HNRFI to the B581 Station Road in Elmesthorpe, is included in the draft Order Limits because it would be required for access by pedestrians, cyclists, horse riders and emergency service vehicles in connection with the Proposed Development. This road is not proposed for routine use in connection with the construction or operation of the HNRFI.

2.16. Access to other residential properties in the Main HNRFI Site, including Freeholt Lodge and Hobbs Hayes to the north of M69 Junction 2, is from a track that extends from Smithy Lane, which branches from the B4669 Hinckley Road.

2.17. As noted above, Burbage Common Road crosses the Leicester to Hinckley railway by means of a single-lane, hump-backed bridge. Areas of land around the Burbage Common Road overbridge and two pedestrian crossings over the railway are included in the Main Order Limits to allow for the proposed demolition and replacement of this bridge.

2.18. To the north-west of the existing Burbage Common Road railway bridge the Main Order Limits include the A47 Link Road corridor.

Landform

2.19. Chapter 11: *Landscape and visual effects* of this PEIR describes the local landform in detail. The DCO Site lies in National Character Area (NCA) 94 'Leicestershire Vales', which comprises an open landscape of gentle clay ridges and valleys used for a mixture of pasture and arable agriculture, bisected by small watercourses.

2.20. Figure 11.6 in Chapter 11 shows the topography or the shape of the land inside and beyond the Main Order Limits. Although to casual inspection the Main HNRFI Site appears broadly level, it slopes gently downhill from a high point of 110m Above Ordnance Datum (AOD – i.e. above sea level) adjacent to M69 Junction 2 to a low point of 83m AOD beside the railway at the northern end of the Main HNRFI Site.

2.21. South-west of M69 Junction 2 the M69 motorway falls gently to a height of c. 96m AOD at the southern extremity of the DCO Site.

2.22. To the west of the railway the A47 Link Road corridor falls from 99m to c. 93m before rising gently to 96m where it joins the A47 Leicester Road. This gentle valley is associated with an unnamed watercourse.

Watercourses

2.23. An unnamed stream flows north-eastwards through the southern portion of the Main Site before running alongside the M69 motorway. Several field drainage ditches and small ponds are also present inside the Main Order Limits. These discharge into an unnamed tributary of the Thurlaston Brook which is referred to in the PEIR as Thurlaston Brook Tributary, a tributary of the River Soar, to the north of the Site.

Land use and landscape

2.24. Most of the Main HNRFI Site and the land inside the Main Order Limits to the west comprise a regular pattern of fields used for arable farming and grazing. The fields are defined by hedgerows and interspersed with deciduous trees. Interspersed amongst the fields are a small number of agricultural dwellings and outbuildings with a cluster of buildings at Woodhouse Farm in the centre of the Main HNRFI Site.

2.25. Businesses in and immediately adjacent to the Main HNRFI Site include a farm shop at Woodhouse Farm, close to the centre of the Main HNRFI Site, and the Wentworth Livery Stables on Burbage Common Road to the south of Elmesthorpe. Burbage Common Road serves as an equestrian route to Burbage Common for riders from the stables.

THE SURROUNDING AREA

2.26. Areas immediately outside of the Main Order Limits are generally similar in character, comprising level or gently undulating farmland interspersed with farmsteads, smallholdings and free-standing dwellings. Disused stone quarries are a noteworthy feature in the local landscape to the east of the Main HNRFI Site.

2.27. The closest settlements to the Main HNRFI Site are the village of Elmesthorpe along the B581 Station Road to the north and a mobile home park and a separate gypsy and traveller settlement off Smithy Lane to the south-west of M69 Junction 2. In the wider area and generally at a range of 2-3km from the Main HNRFI Site are the settlements of Stoney Stanton and Sapcote to the east, Earl Shilton and Barwell to the north and north-west, Hinckley and Burbage to the west and south-west and the village of Aston Flamville to the south.

2.28. Elmesthorpe has been settled since the Roman era and has a population of just over 500. Village landmarks include the 13th century St Mary's Church, partly ruined but restored at a smaller scale. Elmesthorpe railway station closed in the 1960s but the village retains a hotel and a pub.

2.29. Off Smithy Lane to the south of the Main HNRFI Site are two residential enclaves in fenced compounds – the Aston Firs Gypsy and Traveller site managed by LCC and the Castle Fields mobile home site, which is privately owned.

2.30. The village of Sapcote to the east has a population of c. 2,700. The village is a focus for community activities with a social club, pub and neighbourhood retail facilities. Stoney Stanton to the north of Sapcote has a population of almost 4,000 and includes neighbourhood-level retail, pub and dining facilities. Between Sapcote and Stoney Stanton lies Stoney Cove, a diving adventure centre in a former stone quarry with a waterside pub and restaurant.

2.31. Burbage Common and Burbage Wood to the south-west of the Main HNRFI Site are a

popular recreational resource managed by Hinckley and Bosworth Borough Council, providing woodland and open meadows for informal recreation, with car parks and a visitor centre. Hinckley Golf Course lies beyond Burbage Common, on the edge of Hinckley itself.

ENVIRONMENTAL DESIGNATIONS

Landscape

2.32. Land inside the Main Order Limits and for a wide area around is not subject to any protective landscape designations. The closest designated Area of Outstanding Natural Beauty (AONB) to the Main HNRFI Site is the Cannock Chase Area of Outstanding Natural Beauty, 43km to the north-west. The closest designated National Park is the Peak District, 60km to the north-north-west.

2.33. As noted above, in respect of landscape character the DCO Site lies within Natural England's National Character Area (NCA) no. 94 'Leicestershire Vales', which feature 'low-lying clay vales and river valleys'.

2.34. In the Blaby District Character Assessment (2008) the Main HNRFI Site lies in two Landscape Character Types (LCT). The northern area of the HNRFI Site falls within LCT A 'Floodplain' and the southern area is within LCT G 'Wooded Farmland'. In terms of Landscape Character Areas (LCA), the Main Site falls similarly within two zones. The northern parts of the HNRFI Site lie in LCA E: 'Elmesthorpe Floodplain' and the southern portions are located in LCA A: 'Aston Flamville Wooded Farmland'. Explanations of the meaning and significance of these characterisations is provided in Chapter 11: *Landscape and visual effects* of this PEIR.

Nature conservation

2.35. The Burbage Wood and Aston Firs Site of Special Scientific Interest (SSSI) lies close to the south-western boundary of the Main HNRFI Site and outside the DCO Site. This SSSI is designated for its mixed ash, oak and maple woodland, one of the best remaining examples in Leicestershire. The SSSI adjoins the Burbage Common and Woods Local Nature Reserve (LNR).

2.36. Three further SSSIs are found to the north-east of the Main HNRFI Site and outside the DCO Site, as follows:

- Croft Pasture SSSI (2.8km from the nearest point of the Main Order Limits), an area of acidic mixed grassland;
- Croft and Huncote Quarry SSSI (3.1km from the nearest point of the Main Order Limits), designated for geological reasons;
- Croft Hill SSSI (3.2km from the nearest point of the Main Order Limits), an area of

tussocky acid grassland, the largest of its kind in Leicestershire.

2.37. There is one European-designated Special Area of Conservation (SAC) within 15km of the Main Order Limits, at Ensor's Pond, 11km to the south-west. It is designated for its large population of white-clawed crayfish.

2.38. In terms of non-statutory designated sites, Leicestershire and Rutland County Councils use a system of Local Wildlife Sites (LWS), candidate Local Wildlife Sites (cLWS) and potential Local Wildlife Sites (pLWS). LWS are designated sites, cLWS are sites that meet the criteria of being a LWS but have not yet been designated, and pLWS are sites that might meet the criteria but have not yet been assessed.

2.39. Within 2.5km of the Main Order Limits there are thirteen non-statutory Local Wildlife Sites (LWS), three of which lie partly inside the DCO Site (Burbage Common and Woods, Field Rose Hedgerow, Elmesthorpe Plantation Hedgerow). There are several potential LWS within the Main Order Limits for which designation has not been formalised. These include Freeholt Meadow, Castlewood Grassland, Burbage Common Road Hedgerows, Burbage Common Road Railway Bridge, M69 Junction 2 Grassland, B4669 Road Verge and Elmesthorpe Boundary Hedgerows. Further descriptions of these habitats are provided in Chapter 12: *Ecology and biodiversity* of this PEIR.

Cultural heritage

2.40. There are no designated World Heritage Sites, scheduled monuments, listed buildings, registered parks and gardens, battlefields, or conservation areas inside the DCO Site.

2.41. In general terms, the majority of designated heritage assets in the wider area comprise listed buildings clustered in the historic cores of local settlements. Within 5km of the Main HNRFI Site are six scheduled monuments, 98 listed buildings and nine conservation areas. There are several groups of listed buildings in the settlements of Stoney Stanton to the east, including the Grade II* listed Church of St Michael, and in Elmesthorpe to the north is the Grade II listed Church of St Mary. The Church of St Mary in Barwell, 1.8km to the north-west of the Main HNRFI Site and 0.75km from the western end of the proposed A47 Link Road, is a Grade I listed building.

2.42. Scheduled monuments closest to the Main HNRFI Site include the ruined church at Elmesthorpe to the north, and Sapcote Castle and Moat on the west edge of Sapcote, 2km to the east-south-east. The Aston Flamville Conservation Area lies 1.3km to the south of the Main Site and lies c. 100m from southern arm of the Main Order Limits that contains the southbound slip road proposed as part of the reconfiguration of M69 Junction 2.

2.43. Further non-designated heritage assets and finds in the DCO Site and surroundings are identified in the Chapter 13: *Cultural heritage* of this PEIR. These include medieval crop marks.

Agricultural land quality

2.44. Natural England maintains a grading system for agricultural land on a scale of 1 (excellent) to 5 (very poor). Farmland within the Main Order Limits generally falls within grade 3a (good) and 3b (moderate). In general terms this means that the land can be farmed for a variety of purposes with a few limitations that affect the choice of crops, timing and type of cultivation, harvesting or the level of yield.

Flood risk

2.45. The Environment Agency's (EA) Flood Zone map shows the majority of the land inside the Main Order Limits to be in Flood Zone 1. This indicates that the land is largely at low risk of flooding (a less than 1 in 1,000 annual probability of river flooding). Limited areas around the Thurlaston Brook Tributary, which crosses the corridor of the proposed A47 Link Road to the west of the Leicester to Hinckley railway and then flows through the extreme northern corner of the Main HNRFI Site, are in Flood Zone 2 (between a 1 in 100 and 1 in 1,000 annual probability of flooding) and flood zone 3 (a 1 in 100 or greater annual probability of river flooding). Flood risk is considered in detail in Chapter 15: *Surface water and flood risk* of this PEIR.

WORKS TO HIGHWAYS AND RAILWAY LEVEL CROSSINGS

2.46. The DCO Site includes land outside the Main Order Limits required for modifications to roads and pedestrian level crossings over the Leicester to Hinckley railway, at the locations described in Tables 2.1 and 2.2 below and shown on Figure 3.3 of this PEIR.

Table 2.1: Land included in the draft Order Limits to accommodate modifications to roads in connection with the HNRFI development

No.	Location and site description
	Blaby DC
B1	Mini-roundabout at the junction of B581 Station Road / New Road and Hinckley Road, Stoney Stanton, adjacent to the Living Rock Church to the north and Stoney Stanton Social Club to the south.
B2	Junction of B4669 Hinckley Road and Stanton Lane, a T-junction adjacent to Sapcote Garden Centre
B3	Stanton Lane / Hinckley Road, south-west of Stoney Stanton, a single carriageway two-lane road runs through linear suburban development into countryside.
B4	B4669 Hinckley Road / Leicester Road, Sapcote - a single carriageway two-lane road that forms the main east-west route through the village.
B5	A T-junction opposite the Mill on the Soar pub and restaurant at the junction of B4114 Coventry Road and B581 Broughton Road at Soar Mill, Broughton Astley, south-east of Stoney Stanton.
B6	B4114 Coventry Road and Croft Road, a T-junction next to the Esso filling station, south-west of Narborough.
	Hinckley and Bosworth BC
HB1	Crossroads in a suburban setting forming the junction of A47 Normandy Way and A447 Ashby Road, on the northern edge of Hinckley.
HB2	Roundabout at the junction of A47 Normandy Way / Leicester Road, the B4668 Leicester Road and The Common, adjacent to the Leicester Road Stadium south-east of Barwell.
HB3	B4668 Leicester Road 300m south of the junction with the A47 Normandy Way, where a new junction for a proposed link road from M69 Junction 2 is proposed.
	Harborough DC / Rugby BC
HR1	Cross in Hand roundabout at the junction of the A5 Watling Street, A4303 Coventry Road, B4428 Lutterworth Road and Coal Pit Lane, adjacent to the Magna Park South distribution centre west of Lutterworth.

Table 2.2: Land included in the draft Order Limits to accommodate modifications to pedestrian level crossings in connection with the proposed HNRFI development

Level crossing	Location and site description
Thorney Fields Farm No 2: Grid Ref: SP480959 Footpath No. XU17/2 1 km NW of Sapcote.	Land required to enable the permanent closure of the pedestrian level crossing and the diversion of the footpath over an existing bridge over the railway south of Thorney Fields Farm.
Elmesthorpe: Grid Ref: SP471958 Footpath No. T89/1 between Bostock Close and the B581 Station Road, opposite the Wentworth Arms public house.	Land required to enable the permanent closure of a pedestrian level crossing and the diversion of pedestrian traffic over the existing Station Road bridge.
Billington Rough: Grid Ref: SP460954 Footpath No: U50/3-U50/4 from Elmesthorpe.	Land required to enable the permanent closure of a pedestrian level crossing and a footpath diversion to a new railway bridge proposed for the A47 Link Road.
East of Bridge Farm: Grid Ref: SP457952 Footpath No. V23/1 from Barwell.	Land required to enable the permanent closure of a pedestrian level crossing and a footpath diversion to a new railway bridge proposed for the A47 Link Road.
The Outwoods: Grid Ref: SP442941 Footpath no. U8/1-U52/1, connecting Burbage and the Hinckley Academy and John Cleveland Sixth Form Centre in Hinckley.	Land required to enable the permanent closure of the level crossing, its replacement with a new pedestrian footbridge, and associated footpath diversions.

Tritax Symmetry (Hinckley) Limited

HINCKLEY NATIONAL RAIL FREIGHT INTERCHANGE

Preliminary Environmental Information Report

Chapter 3: Project description

January 2022

This document forms a part of a Preliminary Environmental Information Report (PEIR) for the Hinckley National Rail Freight Interchange project.

A PEIR presents environmental information to assist consultees to form an informed view of the likely significant environmental effects of a proposed development and provide feedback.

This PEIR has been prepared by the project promoter, Tritax Symmetry (Hinckley) Limited. The Proposed Development is described in Chapter 3 of the PEIR and is the subject of a public consultation running from 12 January to 9 March 2022.

Details of how to respond to the public consultation are provided at the end of Chapter 1 of the PEIR and on the project website:

http://www.hinckleynrfi.co.uk/

This feedback will be taken into account by Tritax Symmetry (Hinckley) Limited in the preparation of its application for a Development Consent Order for the project.

Chapter 3 ◆ Project description

INTRODUCTION

3.1 This chapter of the PEIR describes the Project that the Applicant is consulting on. It begins by explaining the purpose of the Proposed Development and then describes the proposed rail and road infrastructure, buildings, the landscape strategy and public rights of way. The chapter concludes with explanations of development construction and phasing and of how the HNRFI would operate.

3.2 This chapter provides the definitive project description on which other chapters of the PEIR rely. It should be read in conjunction with the HNRFI Illustrative Master Plan shown in Figure 3.1, the DCO parameters plan shown in Figure 3.2 and the off-site highways and junction improvement plans presented in Figures 3.3.

3.3 The Planning Act 2008 provides that development consent may be granted for both a NSIP, referred to as the 'Principal Development' in this document, and for 'Associated Development', which is development associated with the Principal Development. This distinction is made in the description of the authorised development in the draft DCO that accompanies this PEIR for consultation purposes. However, the distinction is not relevant to an assessment of the Proposed Development's environmental effects, which should be considered in the round.

PURPOSE OF A STRATEGIC OR NATIONAL RAIL FREIGHT INTERCHANGE

3.4 Paragraph 2.44 of the NPS states:

'The aim of a strategic rail freight interchange (SRFI) is to optimise the use of rail in the freight journey by maximising rail trunk haul and minimising some elements of the secondary distribution leg by road, through co-location of other distribution and freight activities. SRFIs are a key element in reducing the cost to users of moving freight by rail and are important in facilitating the transfer of freight from road to rail, thereby reducing trip mileage of freight movements on both the national and local road networks'.

3.5 Paragraph 4.88 of the NPS describes the key elements of a SRFI application:

'Applications for a proposed SRFI should provide for a number of rail connected or rail accessible buildings for initial take up, plus rail infrastructure to allow more extensive rail connection within the site in the longer term. The initial stages of the development must provide an operational rail network connection and areas for intermodal handling and container storage. It is not essential for all buildings on the site to be rail connected from the outset, but a significant element should be.'

3.6 Accordingly, a SRFI provided under the Planning Act 2008 as a NSIP must provide the

following types of rail freight facility:

- an intermodal area where containers are lifted between rail freight wagons and container lorries;

- rail-connected buildings either with their own dedicated rail siding or sufficiently close to the rail terminal to allow containers to be moved from the rail wagons into the warehouse by overhead cranes or reach stackers without the need for them to be loaded first onto a HGV or 'tugmaster' yard tractor vehicle;

- rail-served buildings which allow containers to be moved from the rail wagons into the warehouse by means of a HGV or tugmaster vehicle.

- rail-accessible buildings with the potential either to be rail-connected or rail-served.

OVERVIEW OF THE CURRENT PROPOSALS

3.7 In summary, the Proposed Development comprises the following main components.

Development on the Main HNRFI Site

a) The demolition of Woodhouse Farm, Hobbs Hayes, Freehold Lodge and the existing bridge over the Leicester to Hinckley railway on Burbage Common Road;

b) new rail infrastructure including points off the existing Leicester to Hinckley railway providing access to a series of parallel sidings at the HNRFI, in which trains would be unloaded, marshalled and loaded;

c) an intermodal freight terminal or 'Railport' capable of accommodating up to 16 trains up to 775m in length per day, with hard-surfaced areas for container storage and HGV parking and cranes for the loading and unloading of shipping containers from trains and lorries;

d) up to 850,000 square metres (gross internal area or GIA) of warehousing and ancillary buildings with a total footprint of up to 650,000 square metres and up to 200,000 square metres of mezzanine floorspace. These buildings might incorporate ancillary data centres to support the requirements of HNRFI occupiers and operators. They would also incorporate roof-mounted photovoltaic arrays with a generation capacity of up to 38 megawatts (MW), providing direct electricity supply to the building or exporting power to battery storage in the energy centre;

e) an energy centre incorporating an electricity substation connected to the local electricity distribution network and a gas-fired combined heat and power plant with an electrical generation capacity of up to 10 megawatts (MW), supported by 20 MW standby generation capacity and 20MW battery capacity to provide electrical supply resilience. Total electricity generation capacity would not exceed 50 MW;

f) a lorry park with welfare facilities for drivers and HGV fuelling facilities;

g) a site hub building providing office, meeting space and marketing suite for use in connection with the management of the HNRFI and ancillary car parking;

h) terrain remodelling, hard and soft landscape works, amenity water features and planting;

i) noise attenuation measures, including acoustic barriers up to six metres in height;

j) habitat creation and enhancement and the provision of publicly accessible amenity open space at the south-western extremity of the HNRFI near Burbage Wood and to the south of the proposed A47 Link Road between the railway and the B4668/A47 Leicester Road;

k) pedestrian, equestrian and cycle access routes and infrastructure, including a new dedicated route for pedestrians, cyclists and horse riders from a point south of Elmesthorpe to Burbage Common;

l) utility compounds, plant and service infrastructure;

m) security and safety provisions inside the HNRFI including fencing and lighting;

n) drainage works including groundwater retention ponds, underground attenuation tanks and swales;

Highway works

o) works to M69 Junction 2 comprising the reconfiguration of the existing roundabout and its approach and exit lanes, the addition of a southbound slip road for traffic joining the M69 motorway and the addition of a northbound slip road for traffic leaving the M69 motorway at Junction 2.

p) a new road ('the A47 Link Road') from the modified M69 Junction 2 to the B4668 / A47 Leicester Road with a new bridge over the railway, providing vehicular access to the proposed HNRFI from the strategic highway network. The A47 Link Road would be intended for adoption as a public highway under the Highways Act 1980.

q) modifications to several junctions and amendments to Traffic Regulation Orders on the local road network in response to the different traffic flow pattern resulting partly from the trips generated by the HNRFI development and principally from the change in movements as a result of the M69 Junction 2 upgrade;

r) works affecting existing pedestrian level crossings on the Leicester to Hinckley railway at Thorney Fields Farm north-west of Sapcote, at Elmesthorpe and at Outwoods between Burbage and Hinckley. In addition, pedestrian level crossings serving

footpaths that connect Burbage Common Road to Earl Shilton and Barwell are proposed for closure with the associated footpaths being diverted;

s) off-site (outside the Order Limits) railway infrastructure including signals, signage and electricity connections.

3.8 The main project elements will now be described in detail.

ELEMENTS OF THE PROPOSED DEVELOPMENT

The Main HNRFI Site

3.9 The development of the HNRFI comprises the following elements.

Demolition

3.10 Existing buildings on the Main HNRFI Site, forming three clusters at Woodhouse Farm, Hobbs Hayes and Freehold Lodge, would be vacated and demolished in order to facilitate the regrading of the land in preparation for development.

3.11 The existing single-lane hump-back bridge over the Leicester to Hinckley railway on Burbage Common Road would also be demolished to make room for Railport infrastructure, with a replacement bridge provided nearby for the proposed A47 Link Road.

Rail infrastructure

3.12 The HNRFI would be located adjacent to Network Rail's strategic freight route linking the west coast and east coast main lines and serving as a primary link between Felixstowe and the Midlands and North. Locally this route passes between Leicester and Hinckley and takes the form of two parallel railway tracks. The line is not currently electrified and is used exclusively for diesel-hauled freight and passenger traffic. The closest passenger stations are Hinckley 2.7 km to the south-west and Narborough in the direction of Leicester, 10 km to the east-north-east.

3.13 Provision is made for two connections to the main line, allowing access for trains arriving from or departing in either direction with crossovers on the main line itself to allow freight trains to move from one track to another. As such, a train from the west would cross to the eastbound line before entering the terminal, and a train from the east would be able to enter directly from the westbound line.

3.14 Connections into the HNRFI from the main line have been designed so that trains can enter the terminal at a safe and appropriate speed, minimising the time that an arriving train takes to vacate the main line. This is to avoid causing delays to other rail services. Trains carrying containers would enter the site from either direction and would run directly into the proposed Railport.

The Railport

3.15 On arrival, trains would be directed to one of the reception sidings in the Railport, four of which are served by gantry cranes for unloading and loading, with the other four used as a holding and marshalling area for trains. Trains in this latter area would be moved to a final position for unloading via a proposed 'run-around chord' that comprises an additional pair of sidings curving around the northern edge of the HNRFI. The chord would provide links to rail-connected buildings and would assist train marshalling generally.

3.16 The reception sidings would include provision for future electrification, so that the Railport is capable of being used by electric or 'bi-modal' trains that can use either diesel or electric power. The reception sidings taper at both ends of the Railport to enable a locomotive to reposition to the opposite end of a train in readiness for the outward journey. The Railport also includes a 'cripple siding' to which faulty locomotives and rolling stock would be shunted.

3.17 The proposed rail infrastructure would have the capacity to handle up to 16 trains per day, equating to 16 inbound movements and 16 outbound movements or 32 train movements in total. Trains would be up to 775 metres in length, reflecting Network Rail's strategy to increase maximum train lengths from the established length of 600 metres to provide more capacity and reduce costs per container.

3.18 The Railport is where containers are transferred to and from trains. It comprises a level area of concrete running along most of the length of the sidings on the western side of the Main HNRFI Site. In this area, containers would be unloaded and loaded onto trains by means of gantry cranes or free-moving 'reach stacker' vehicles – wheeled cranes designed to lift freight containers.

3.19 Up to four mobile gantry cranes up to 28 metres in height and with a span of up to 40 metres are proposed. The cranes would run under electric power on rubber tyres to assist quiet operation. Inbound containers would either be placed in stacks in the Railport or placed directly onto lorry or tugmaster trailers. Stacked containers would be a maximum of five containers high or up to 14.5 metres in total. Other containers would be transferred to one of the logistics warehouses in the HNRFI or for dispatch off-site for direct delivery to customers. Outbound containers would be loaded onto trains by the same process in reverse.

3.20 Empty containers would be stacked in a separate 'Railport returns area' located to the south of the proposed A47 Link Road adjacent to the south-western end of the Railport. Empty containers would be placed in stacks of up to seven containers to a maximum height of 20.3 metres, whilst they await collection by train or lorry.

3.21 The Railport would be fenced for security and would incorporate ancillary office, maintenance and mess room accommodation and car parking for Railport staff. It would be lit to enable 24-hour operation, using lighting designed to minimise light pollution including directional lighting on gantry cranes. Lighting would be pole-mounted with a maximum height of 25 metres. Directional LED lighting would be installed to minimise

light spill.

3.22 The proposed rail infrastructure would be built in phases to reflect demand. The envisaged phasing is described later in this chapter.

B8 logistics buildings

3.23 The greater part of the Main HNRFI Site would be occupied by buildings falling within use class B8 (storage or distribution) of the Town and Country Planning (Use Classes) Order 1987. The HNRFI would contain a total floor area of up to 650,000 square metres at ground floor level and, in the B8 buildings, up to a further 200,000 square metres of mezzanine floorspace.

3.24 The buildings would provide high-bay storage in a single land parcel bounded by the railway to the north-west and the M69 motorway to the south-east. The B8 buildings will be up to a maximum height of 33m. Table 3.1 below describes the proposed maximum floorspace and building height parameters in the zones identified on the parameters plan in Figure 3.2. The proposed development parameters are explained in further detail in paragraphs 3.72 – 3.76 of this chapter.

Table 3.1: Proposed development zones for B8 logistics units with maximum building parameters

Development zone	**Maximum number of buildings in each development zone**	**Maximum internal built footprint** (m^2)	**Maximum building heights to ridge** (metres above finished ground level)
A	**1 to 6**	**105,000**	**27**
B	**1 to 5**	**115,000**	**33**
C	**1 to 6**	**140,000**	**30**
D	**1 to 4**	**184,000**	**30**
E	**1 to 3**	**137,000**	**27**
Maximum total floorspace across the Main HNRFI Site (excl. mezzanine space):		**650,000***	**-**

* *The individual floorspace maxima for Zones A to E add up to 681,000 m^2. However, this would be subject to an overall cap on floorspace in the HNRFI of 650,000 m^2.*

3.25 Proposed building heights would allow the logistics area to accommodate modern automation systems and occupiers requiring high bay racking. These buildings will incorporate loading bays in the external walls and will have associated areas for lorry manoeuvring and parking and staff car parks. Containers would be transferred to and from buildings from the Railport using tugmaster yard tractors, towing trailers on to which

single containers would be loaded. The proposed development parameters for the HNRFI include flexibility for rail-connected buildings handling non-containerised freight.

3.26 Within these maximum total floor areas the draft DCO specifies the maximum number of B8 buildings proposed in each zone of the site. This will ensure that the development can reflect occupier demand, which might be for a few very large buildings or a larger number of smaller buildings.

3.27 As Figures 3.1 and 3.2 show, it is proposed that the B8 buildings are arranged efficiently with rail-connected buildings generally next to the Railport and rail-served buildings located on other parts of the site.

3.28 Sustainable drainage systems (SUDS) would be employed in hard-surfaced areas wherever suitable. The detailed SUDS design would be the subject of submissions to Blaby District Council under the terms of a proposed DCO Requirement [1].

3.29 With a combined roof area of up to 65 hectares the HNRFI offers substantial potential for roof-mounted solar photovoltaic installations, providing renewable electricity. All of the proposed B8 buildings on the site would be able to accommodate solar photovoltaic (PV) panels on their roofs, giving a potential electricity generation capacity of up to 38 MW. The electricity generated would either supply the occupier of the building or be exported to the battery storage facility in the energy centre, for subsequent use by occupiers.

3.30 The detailed design of B8 buildings would be the subject of submissions to Blaby District Council under the terms of a proposed DCO Requirement. The Applicant proposes that a design code for buildings and landscape in the HNRFI would be submitted to Blaby District Council for approval. A draft of the design code will be submitted with the DCO application for the project. The design code would ensure consistency in the appearance of development across the site. Figure 3.4 provides images of the Applicant's recent logistics developments elsewhere to provide a general idea of how the B8 buildings might appear.

3.31 The proposed B8 buildings might include ancillary data centres providing occupiers with centralised computer facilities for data storage and networking. Data centres play an important role in the tracking of freight and would be located inside the proposed B8 buildings.

3.32 The security requirements for each building plot will reflect individual occupier requirements. Some buildings will be in fenced and gated compounds, the design of which would be the subject of detailed submissions to Blaby District Council in response to DCO Requirements.

3.33 Within the Main HNRFI Site, internal distributor roads would branch from the A47 Link Road to serve B8 buildings across the site. These internal distributor roads would be single carriageway roads set in landscaped corridors. The roads would be lit using lighting designed to minimise light pollution. These internal roads are not intended for adoption

[1] *The proposed DCO Requirement would be akin to a planning condition in a conventional outline planning permission requiring the approval of reserved matters.*

as public highways under the Highways Act 1980 but would be private roads available for public use. These roads would be maintained by the appointed management company. The Railport would have a lit, private, dedicated access off the A47 Link Road.

3.34 Car parks would be provided adjacent to the Railport and each B8 building for staff and visitors. The indicative master plan (Figure 3.1) demonstrates that the proposed development parameters allow for the provision for HGV and car parking to local authority standards, totalling approximately 1,000 lorry spaces and 5,000 car parking spaces.

Energy centre

3.35 The HNRFI would include an energy centre incorporating an electricity substation connected to the local electricity distribution network and a gas-fired combined heat and power plant with an electrical generation capacity of up to 10 MW, supported by a 20 MW standby generator. The energy centre would also incorporate a 20 MW battery storage facility to provide electrical supply resilience. It would be located alongside the proposed lorry parking area to the south of the A47 Link Road and would occupy an enclosed area up to 50 x 50m in plan, with a clad perimeter wall up to 6m in height and exhaust stacks up to 12m in height.

Lorry park with welfare and fuelling facilities

3.36 This would be located to the south of the proposed A47 Link Road, from which it would be accessed. Access to the lorry park, driver welfare building and lorry filling station would be controlled so that it is available for HNRFI-related hauliers only. This is in order to prevent the facility being used as a general-purpose service area and truck stop by passing motorway traffic.

Site hub

3.37 A two-storey site hub building containing site management and security offices and a marketing suite is proposed in an area to the south of the A47 Link Road near Freeholt Wood.

Terrain remodelling, landscape and planting

3.38 The natural terrain inside the Main HNRFI Site would be remodelled to provide two level plateaux for development. The height and shapes of the plateaux have been determined having regard to a desire to achieve a 'cut-fill balance' across the site, removing the need to import or export spoil.

3.39 The HNRFI would be the subject of a landscape and planting strategy incorporating the following main components.

- *Boundary landscape areas* – these are designed to help integrate the development into the surrounding landscape, with the subsidiary functions of noise attenuation and provision of biodiverse corridors of wildlife habitat. The boundary landscape areas would incorporate bunds of up to 3 metres in height, species-rich native tree and shrub

planting, areas of wet grassland and wildflower grassland and balancing ponds and swales. The boundary areas would incorporate security fencing and, where necessary, acoustic fencing.

- *Internal road corridors* – the main internal roads would be set in tree-lined corridors, some of which will incorporate water features. The roundabouts in the development will each be given a landmark landscape treatment.

Noise attenuation

3.40 To protect the amenity of local residential communities and areas enjoyed for recreation such as Burbage Common, noise attenuation measures are incorporated into the emerging parameters plan and shown on the master plan for the proposed HNRFI, including the following:

- a stepped acoustic barrier of between 2.0 and 3.0 metre in height to the north to mitigate impacts on residential receptors;
- acoustic barriers up to 4.0 metres in height to the north-east to mitigate impacts on residential receptors;
- acoustic barriers up to 6.0 metres in height to the south-west to mitigate impacts on residential receptors;
- acoustic barriers up to 6.0 metres in height to the south-west to mitigate impacts on users of Burbage Common.

3.41 Further measures are proposed to reduce noise during construction and operation. During construction, contractors will be required to follow best practice measures set out in a Construction Environmental Management Plan (CEMP). For the HNRFI in operation, noise limits are proposed in relation to fixed plant, equipment and break-out noise, where detailed information is not available at the time of writing, to protect residential amenity in the worst case (noise limits are set-out in PEIR Chapter 9, Table 9.42). Careful consideration will need to be given to gantry crane and other mobile plant procurement to source quiet equipment where possible, and this is covered in PEIR Chapter 9.

Amenity land and habitat creation

3.42 At the south-western corner of the main site an area of publicly-accessible open amenity land 22.66 hectares in extent, is proposed. This is intended to serve as a zone of transition between the HNRFI to the north-east and the habitats and open spaces provided by Burbage Common, Burbage Wood and Aston Firs to the west and south.

3.43 The amenity land, which is currently divided into small agricultural fields with peripheral public footpaths, would be sown with meadow grassland mix. Groups of trees and shrubs would also be planted and water features introduced, all with the intention of creating an area rich in biodiversity and being attractive for informal recreation.

3.44 A similar landscape treatment is proposed on land to the west of the existing railway and to the south of the proposed A47 Link Road. This land is c. 14.5 hectares in area and is intended to provide an amenity area contiguous with Burbage Common to the south,

3.45 The development of greenfield land can result in the loss of 'biodiversity' –, the range of plant and animal life that the land is able to sustain. In accordance with the Environment Act 2021 the Applicant is committed to delivering a 10% net gain in biodiversity in conjunction with the Project.

3.46 The landscape strategy for the Proposed Development includes provision for wildlife habitat enhancement. However, this in itself would be insufficient to deliver a 10% biodiversity net gain. In response, the Applicant is evaluating land off-site to meet the biodiversity net gain obligation. Further information on the strategy and approach is provided in Chapter 12: *Ecology and biodiversity* of this PEIR.

Public rights of way and amenity routes

3.47 The proposed closure, diversion and creation of public rights of way (PROW) and permissive amenity routes on the Main HNRFI Site are shown in Figures 11.13 and 11.14 of this PEIR. It is proposed that Burbage Common Road, which crosses the central area of the Main HNRFI Site, would be closed to through traffic from a point c. 320 metres south of the junction with the B581 Stanton Road to the west of the existing railway bridge. Access to the Main HNRFI Site via Burbage Common Road at its northern end near Elmesthorpe would be restricted to emergency vehicles, pedestrians, cyclists and horse riders only.

3.48 In recognition of the fact that Burbage Common Road serves as an amenity route for walkers, cyclists and horse riders, a replacement route between Elmesthorpe and Burbage Common is proposed. From a point on Burbage Common Road south of Elmesthorpe, the proposed amenity route would run along the eastern side of the HNRFI in a landscaped corridor alongside the M69 motorway. This corridor would incorporate a water course diverted from inside the Main HNRFI Site and would incorporate provision for pedestrians, cyclists and horse riders and would connect with an existing bridleway that originates north of Stoney Stanton and enters the Main HNRFI Site by means of a bridge over the M69 motorway 900 metres to the north-east of M69 Junction 2.

3.49 At the south-eastern corner of the Main HNRFI Site the proposed amenity route would cross the main access road from M69 Junction 2 by means of a signalised 'Pegasus crossing' - a clearly-marked crossing suitable for equestrian traffic, with safety barriers and crossing signals. The amenity route would then head north-westwards towards the proposed amenity land, described below, on the south-western side of the HNRFI. From the amenity land, access can then be gained to Burbage Common itself via Smithy Lane and an existing underpass beneath the railway.

Utilities infrastructure

3.50 The Proposed Development would include appropriate provision for the diversion of some existing utilities, the supply of water, electricity and gas, and interconnectivity for

telecoms and infrastructure for the disposal of foul and surface water. Provision is included within the Main HNRFI Site for new electricity sub-stations, gas metering kiosks, etc. Connections to all existing off site utility infrastructure will be undertaken by utility providers under their existing statutory powers. The points of connection will be determined by these undertakers at a future date.

Security and safety provisions

3.51 The Proposed Development includes security infrastructure to serve the HNRFI, including fencing, gates, security kiosks, and security lighting.

Drainage works including groundwater retention ponds and swales

3.52 The drainage characteristics of the Main HNRFI Site would be modified significantly by the addition of large buildings and extensive hard-surfaced areas. To ensure that the site drains without giving rise to any enhanced risk of flooding on or off the site, the site will be the subject of a comprehensive drainage strategy incorporating sustainable drainage principles and including retention ponds, underground attenuation tanks and swales. Swales are incorporated into the proposed landscape strategy for the HNRFI and will serve a secondary purpose as wildlife habitat.

3.53 The groundwater management and drainage strategy for the HNRFI, including the proposed arrangements for the ultimate discharge of water from the site, is described and assessed in Chapter 14: *Surface water and flood risk* of this PEIR. A central design objective is to ensure that rates of water run-off from the site in wet weather do not exceed current run-off rates, allowing for increased run-off associated with extreme rain events predicted as a consequence of climate change.

Highway and railway works

M69 Junction 2

3.54 M69 Junction 2 would be reconfigured and signalised to enable the addition of a dual carriageway access into the Main HNRFI site, via the proposed A47 Link Road, for operational traffic via the existing roundabout. HGV Route Management measures will be put in place to ensure the use of M69 Junction 2 and the A47 Link Road in preference to the local road network.

3.55 A two-lane northbound off-slip and a two-lane southbound on-slip would be added to M69 Junction 2, making it an 'all-ways' junction and enabling the convenient flow of traffic on the M69 motorway from the direction of Coventry, the M6 motorway and the A5.

3.56 Initial traffic flow assessments have indicated that both slip roads will be two-lane and will join and leave the main line in the usual manner as a 'ghost island taper merge' and a 'ghost island taper diverge' respectively. These arrangements will enable traffic to merge with or diverge from motorway traffic in two separate lanes, with a length of hatching separating the flows.

3.57 Works will affect around 700m of the M69 motorway main line and will include the provision of a retaining wall adjacent to an existing National Grid transmission tower, the extension of a drainage culvert and provision of roadside features including a safety barrier and drainage.

3.58 Further works on the M69 motorway will include amendment of existing advanced direction signage for the southbound off-slip, provision of new advanced directional signage for the northbound off-slip and provision of route confirmatory and services signage for the southbound on-slip.

The A47 Link Road

3.59 The A47 Link Road would be the only non-emergency road access to the HNRFI.

3.60 The section of the proposed A47 Link Road inside the Main HNRFI Site shown on the indicative master plan (Figure 3.1) has a sequence of roundabouts to provide access to service roads and reduce traffic speeds. These roundabouts and the design of the A47 Link Road would be subject to detailed design approval post-consent, in accordance with a proposed DCO Requirement. As shown in the indicative master plan in Figure 3.1, from the M69 Junction 2 the first two sections of the road would be dualled, reducing to a single carriageway as the road proceeds further westward.

3.61 The A47 Link Road crosses the main railway line by means of a new bridge. The bridge would pass over the Railport access road at the southern end of the Railport, the proposed railway sidings, the existing railway and the existing bridleway beyond. It would replace the existing hump-back bridge over the railway, which would be demolished. The new bridge would include a pedestrian walkway and cycleway and would include sufficient height clearance to enable a future electrification of the railway.

3.62 From the proposed railway bridge the A47 Link Road would ramp down to local ground level and proceed north-westwards at grade towards a new roundabout junction on the B4668 / A47 Leicester Road.

3.63 West of the railway the proposed A47 Link Road would be a single carriageway road with footpath and cycleway provision. Landscape works and planting are proposed either side of the road for visual amenity and biodiversity enhancement. The road design will incorporate provisions for drainage and the diversion of existing utility infrastructure. The junction with the B4668 Leicester Road would be lit but the section of the A47 Link Road from there to the proposed railway bridge would be unlit in order to reduce light spillage affecting Burbage Common to the south.

3.64 The A47 Link Road would be open to general traffic and would intercept traffic principally from Barwell and Earl Shilton to the north, which would otherwise be likely to travel to and from the upgraded M69 Junction 2 via existing roads through Hinckley, Burbage, Elmesthorpe and Stoney Stanton.

Off-site highway works

3.65 Traffic modelling has identified a need for modifications to several junctions on the local road network, in response to the different traffic flow pattern resulting partly from the HNRFI and principally from the M69 Junction 2 upgrade, which would change the pattern of traffic flows in the locality. Affected highways and the works potentially required are listed in Table 3.2 and shown in Figure 3.3. In advance of a DCO application being made, the Applicant will continue to refine this list in the light of further road traffic modelling results and consultation feedback. As explained in Chapter 8: *Transport and traffic* of this PEIR, the list in Table 3.2 is considered to be representative of what is required but whilst road traffic modelling continues, the introduction of additional highway improvements cannot be precluded at this stage of the pre-application process.

Table 3.2: Indicative list of modifications to roads proposed in connection with the HNRFI development

No.	Location	Works proposed	Highway Authority
	Blaby DC		
B1	Junction of B581 Station Road / New Road and Hinckley Road, Stoney Stanton	The existing mini-roundabout would be replaced by traffic lights with signalised crossings for pedestrians.	Leics CC
B2	Junction of B4669 Hinckley Road and Stanton Lane, west of Sapcote	Traffic lights would be introduced with a phase to allow pedestrians and cyclists to cross.	Leics CC
B3	Stanton Lane / Hinckley Road, south-west of Stoney Stanton	Reduction of the speed limit to 40mph from the national speed limit; traffic calming features and formalisation of on-carriageway parking	Leics CC
B4	B4669 Hinckley Road/ Leicester Road, Sapcote	Traffic calming features, creation of cycle infrastructure and wider footways, public realm and junction improvements and a bus stop relocation at junction of Church Street and B4669. A new pedestrian crossing is included.	Leics CC
B5	Junction of B4114 Coventry Road and B581 Broughton Road at Soar Mill, south-east of Stoney Stanton	New traffic lights are already scheduled to be introduced as part of the Broughton Astley S278 works (Planning Ref: 19/00856/OUT). The Applicant proposes to widen the carriageway on the northbound approach to the B4114 Coventry Road and on the B581 Broughton Road to	Leics CC

No.	Location	Works proposed	Highway Authority
		provide additional capacity for left-turning traffic on both arms. The left turn on Broughton Road would be provided as separately signalised phase to enable it to run at the same time as the right turn into Broughton Road from Coventry Road to improve the efficiency of the junction.	
B6	Junction of B4114 Coventry Road and Croft Road, south-west of Narborough	Lane widening on junction approaches	Leics CC
	Hinckley and Bosworth BC		
HB1	Junction of A47 Normandy Way and A447 Ashby Road, Hinckley	It is proposed that the approach roads to this junction would all be widened to accommodate additional traffic. Indicative right turn and two lanes would be provided through the junction in a westbound direction. Formal signal-controlled pedestrian crossing points would be introduced.	Leics CC
HB2	Junction of A47 Normandy Way / Leicester Road, the B4668 Leicester Road and The Common, south-east of Barwell	Widening of the entry arm on the B4668 Leicester Road	Leics CC
HB3	Junction of B4668 and New A47 Link Road, north east of the site access (Access Infrastructure)	Provision of a three-arm new roundabout access to the B4668 Leicester Road, including a segregated left turn lane southbound from the A47.	Leics CC
	Harborough DC		
H1	Cross in Hand roundabout at the junction of the A5 Watling Street, A4303 Coventry Road, B4428 Lutterworth Road and Coal Pit Lane, west of Lutterworth	Increased roundabout radius and widened lane entries, with two lanes marked for longer distances for traffic approaching the junction on the A5 Watling Street southbound and on Coal Pit Lane.	National Highways

Traffic Regulation Orders

3.66 In addition to the highway works identified in Table 3.2 (above), Traffic Regulation Orders (TROs) made under the Road Traffic Regulation Act 1984 may be sought at the following

locations, subject to further road traffic modelling and discussions with the relevant highway authority. These are listed in Tables 3.3 to 3.7 below and cover clearways, 24 hour waiting restrictions, amendments to existing speed limit orders, indicative 40 mph (64 kph) speed limit orders and indicative derestriction orders respectively.

Table 3.3: Indicative list of proposed clearway restrictions

Road	Location	TRO Plan ref.	Description
A47 Link Road	From the roundabout junction between the A47 Link Road and the B4668 to the roundabout junction between the A47 Link Road and Site Access Road 2	2.6A	Enforcement of clearway restrictions on the A47 Link Road to prevent vehicles from stopping on the carriageway at any time.
A47 Link Road	From the Junction with the M69 Junction 2 circulatory carriageway to a point c.30 metres north of the junction with the M69 Junction 2 circulatory carriageway.	2.6B	Extension of existing clearway restrictions on the M69 Junction 2 roundabout onto the A47 Link Road
M69 northbound diverge slip road	From a point c.22 metres south of the junction with the M69 Junction 2 circulatory carriageway to the junction with the M69 Junction 2 circulatory carriageway.	2.6B	Enforcement of clearway restrictions from the end of Motorway Regulations on the new slip road to the M69 Junction 2 roundabout
M69 southbound merge slip road	From the junction with the M69 Junction 2 circulatory carriageway to a point c.22 metres south of the junction with the M69 Junction 2 circulatory.	2.6B	Enforcement of clearway restrictions from the M69 Junction 2 roundabout to the beginning of Motorway Regulations on the new slip road

Table 3.4: Indicative list of proposed 24 hour waiting restrictions

Road	Location	TRO Plan ref.	Description
A47 Link Road	From the roundabout junction between the A47 Link Road and Site Access Road 2, to a point c.30 metres north of the junction with the circulatory carriageway	2.6A 2.6B	24-hour enforcement of waiting restrictions (double yellow lines) along both carriageways of the dual carriageway section of the A47 Link

	at the M69 Junction 2 roundabout junction		Road to prevent vehicles from parking on the carriageway.

3.67 In addition to the TRO listed above, proposed speed limit orders may be sought at the following locations subject to further road traffic modelling and discussions with the relevant highway authority:

Table 3.5: Indicative amendments to existing speed limit orders

Order Title	Location	TRO Plan ref.	Changes
The Leicestershire County Council (B4668 Leicester Road, Hinckley) (Imposition of 30mph, 40mph and 50mph Speed Limits) Order 2008	B4668	2.7A	Location of the introduction of the 50mph speed limit on the B4668 to be amended from a point 7 metres south west of the southern boundary of the property *'Penryl'* to a point 35 metres south west of the roundabout junction between the B4668 and the A47 Link Road. The purpose of this change is to reduce the speed limit of the B4668 from 50mph to 40mph on the west side of the proposed roundabout junction between the A47 Link Road and the B4668.

Table 3.6: Indicative 40mph speed limit orders

Road	Location	TRO Plan ref.	Description
B4668	From a point 7 metres south west of the southern boundary of the property Penryl to a point 35 metres south west of the roundabout junction between the B4668 and the A47 Link Road	2.7A	Reduction of the speed limit on this stretch of the B4668 from 50mph to 40mph by means of a new order.
A47 Link Road	From the roundabout junction between the A47 link road and the B4668 to a point c.90m south east on the A47 Link Road	2.7A	Enforcement of 40mph speed limit on northern most section of the A47 Link Road
A47 Link Road	From a point c.220 metres north of the proposed railway bridge	2.7A 2.7B	Enforcement of 40mph speed limit on the A47 Link Road (both single

	to a point c.30 metres north of the M69 Junction 2 roundabout		and dual carriageway sections) from north of the railway bridge to the M69 Junction 2
Stanton Lane / Hinckley Road	From a point c.40 metres south of the junction between Hinckley Road and Underwood Drive to a point c.35 metres north of the junction between Stanton Lane and the B4669	2.7C	Enforcement of a new 40mph speed limit on Stanton Lane / Hinckley Road between the existing 30mph limit in force in Stoney Stanton and the junction of Stanton Lane and the B4669. This road is currently National Speed Limit.

Table 3.7: Indicative derestriction orders

Road	Location	TRO Plan ref.	Description
A47 Link Road	From the junction with the M69 Junction 2 roundabout to a point c.30 metres north of the M69 Junction 2 roundabout	2.7B	Extension of existing derestriction order in force on M69 Junction 2 roundabout to the reduction in speed limit to 40mph on the A47 Link Road. A derestriction order is required to enforce a National Speed Limit on highways that are lit.
M69 motorway northbound diverge slip road	From a point c.22 metres south of the junction with the M69 Junction 2 circulatory carriageway to the junction with the M69 Junction2 circulatory carriageway.	2.7C	Derestriction order to cover the new carriageway between the end of Motorway Regulations on the new slip road and the M69 Junction 2 roundabout (where a derestriction order is in force) A derestriction order is required to enforce a National Speed Limit on highways that are lit.
M69 motorway southbound merge slip road	From the junction with the M69 Junction 2 circulatory carriageway to a point c.22 metres south of the junction with the M69 Junction 2 circulatory.	2.7C	Derestriction order to cover the new carriageway between the M69 Junction 2 roundabout (where an existing derestriction order is in force) and the start of Motorway Regulations on the new slip road. A derestriction order is required to enforce a National Speed Limit on highways that are lit.

Pedestrian level crossings

3.68 As explained in the preceding chapter of this PEIR, the existing Leicester to Hinckley railway features a series of uncontrolled gated pedestrian level crossings serving local PROW routes. These include level crossings at the following locations, shown in Figure 3.3 and listed in Table 3.8 below.

3.69 There is the potential for freight trains to be held at signals on their approaches to the HNRFI. Where this happens, trains might temporarily obstruct level crossings or block views along the line, creating a risk that pedestrians might attempt to walk along the railway to get around the end of the train, climb under the couplings of stationary freight wagons or cross when it is not safe to do so because their view of an approaching train is blocked. Following discussion with Network Rail, the Applicant proposes the following measures at these crossings with the aim of maintaining public safety.

Table 3.8: Level crossing modifications proposed in connection with the HNRFI development

Level crossing	Works proposed	Access and limitations proposed in the draft DCO
Thorney Fields Farm No 2: Grid Ref: SP480959 Footpath No. XU17/2 1 km NW of Sapcote.	The level crossing would be closed and the existing public right of way diverted with pedestrians rerouted to an existing bridge over the railway south of Thorney Fields Farm.	Permanent closure and PROW diversion
Elmesthorpe: Grid Ref: SP471958 Footpath No. T89/1 between Bostock Close and the B581 Station Road, opposite the Wentworth Arms public house.	Permanent closure. Pedestrians would instead be able to cross the railway using the existing Station Road bridge, 75 metres to the south-west.	Permanent closure and PROW diversion
Billington Rough: Grid Ref: SP460954 Footpath No: U50/3-U50/4 from Elmesthorpe.	Permanent closure. The footpath to the east of this level crossing is proposed to be stopped up, meaning that the level crossing would have no future purpose. Pedestrian traffic wishing to cross the railway would be diverted to the railway bridge proposed for the A47 Link Road, c. 750 metres to the south-west.	Permanent closure and PROW diversion
East of Bridge Farm: Grid Ref: SP457952	Permanent closure. The footpath to the east of this	Permanent closure and PROW diversion

Level crossing	Works proposed	Access and limitations proposed in the draft DCO
Footpath No. V23/1 from Barwell.	level crossing is proposed to be stopped up, meaning that the level crossing would have no future purpose. Pedestrian traffic wishing to cross the railway would be diverted to the railway bridge proposed for the A47 Link Road, c. 400 metres to the south-west.	
The Outwoods: Grid Ref: SP442941 Footpath no. U8/1-U52/1, connecting Burbage and the Hinckley Academy and John Cleveland Sixth Form Centre in Hinckley.	Replacement of the level crossing with a pedestrian footbridge, with associated public rights of way diversions.	Permanent closure and PROW diversion

3.70 The effects of the Proposed Development on the use of these level crossings are described in Chapter 8: *Transport and traffic* of this PEIR, where proposed mitigation measures are explained.

Railway infrastructure

3.71 Supporting infrastructure will be required along the section of the existing Leicester to Hinckley railway, at and close to HNRFI to enable the proposed rail freight interchange to be integrated with the established railway network. This infrastructure will include railway signals and enhanced safety systems, track points and supporting electrical and monitoring infrastructure in the form of lineside kiosks and connecting cabling.

DEVELOPMENT PARAMETERS

3.72 The DCO application for the Proposed Development will seek consent for development parameters – a maximum outer envelope for specified types of physical development – within which detailed proposals for individual buildings and infrastructure would come forward for subsequent approval. The ES for the project will assess the likely significant environmental effects of these 'Rochdale Envelope' parameters.

3.73 The parameters for the Proposed Development are shown on a parameters plan in Figures 3.2. The parameters for the HNRFI are informed by and reflect the development shown in the illustrative master plan (Figure 3.1). The main features of the parameters plan are described below.

3.74 Six main development zones are proposed, identified as Development Zones A-F in Figure 3.2. The maximum proposed building heights are expressed as height above ground level (AGL) following site levelling and preparation and height above ordnance datum (AOD), a fixed measure of height above mean sea level used as consistent point of reference. In each development zone a maximum number of buildings is proposed. For example, Development Zone B might contain five smaller buildings or anything between one and four larger buildings, in all cases not exceeding a total footprint of 115,000 square metres.

Development Zone A – This zone comprises up to six rail-served buildings with an overall footprint of up to 105,000 square metres and a maximum height to ridge of 27m AGL and 124.15 metres AOD, excluding plant, silos or other ancillary structures.

Development Zone B - This zone comprises up to five buildings, some rail-connected and all rail-served, with an overall footprint of up to 115,000 square metres and maximum heights to ridge of 27 metres AGL and 120.65 metres AOD in sub-zone B1, 33m AGL and 126.65 metres AOD in sub-zone B2 and 27 metres AGL and 120.65 metres AOD in sub-zone B3, in all cases excluding plant, silos or other ancillary structures.

Development Zone C - This zone comprises up to six rail-served buildings with an overall footprint of up to 140,000 square metres and a maximum height to ridge of 27 metres AGL and 124.15 metres AOD in sub-zone C1 and 30 metres AGL and 127.15 metres AOD in sub-zone C2, excluding plant, silos or other ancillary structures.

Development Zone D - This zone comprises up to four rail-connected buildings with an overall footprint of up to 184,000 square metres and a maximum height to ridge of 37 metres AGL and 124.15 metres AOD in sub-zone D1 and 30 metres AGL and 127.15 metres AOD in sub-zone D2, excluding plant, silos or other ancillary structures.

Development Zone E – This zone comprises up to three rail-connected buildings with an overall footprint of up to 137,000 square metres, with a maximum height to ridge of 27 metres AGL and 120.65 metres AOD in sub-zone E1 and 24 metres AGL and 117.65 metres AOD in sub-zone E2, excluding plant, silos or other ancillary structures.

Development Zone F – This zone contains a lorry park and HGV fuelling station, ancillary office and welfare facilities and the energy centre.

3.75 Each development zone includes all elements integral to each development plot, including buildings, hardstandings, parking, landscape and planting, utilities and drainage infrastructure. Although some of the development footprints identified in Development Zones A-F above amounts to 681,000 m^2, the draft DCO provides for a collective overall built footprint of 650,000 m^2, along with a total area of 200,000 m^2 of mezzanine floorspace to be included in the B8 buildings in Development Zones A, B, C, D and E. An area for the proposed energy centre is also identified.

3.76 The parameters plan reproduced in Figure 3.2 also sets parameters for the following;

- rail and Railport infrastructure including connections from the existing railway, sidings, gantry cranes and areas for the temporary stacking of freight containers;

- highway infrastructure corridors including carriageways, landscaping, footpaths, laybys and cycleways. The parameters plan proposes a 'limit of deviation' within which internal roads would be contained;

- external road infrastructure within landscaped corridors, including the proposed upgrades to M69 Junction 2 and the proposed A47 Link Road, including a bridge to replace the existing Burbage Common Road bridge;

- areas for woodland protection, landscape and planting, footpath, bridleway and water course diversions, new ponds and swales and amenity areas for public use;

- a development zone for a site hub containing site management and security offices and a marketing suite, with ancillary parking and planting;

- signage for the development.

CONSTRUCTION AND PHASING

Main works elements

3.77 It is anticipated that the general construction programme will broadly be broken down into following key components, as listed below:

- creation of a construction site access from the M69 Junction 2 roundabout;

- site preparation and clearance;

- rail terminal;

- highway works:

  - M69 Junction 2 improvements;

  - A47 Link Road;

  - additional offsite highways works (mitigation within the existing designated highway).

- on-site works:

  - internal highway works;

  - new bridge across the main railway;

  - earthworks;

- landscape and planting.

- storage and logistics buildings.

Development programme and phasing

3.78 The pace of development will broadly reflect occupier demand and for this reason the programme and phasing set out below is indicative. Subject to the demands of the property market and the detailed design stage being finalised it is anticipated that the below works would be phased over a total period of ten years. The requirement for the southern slip roads at Junction 2 M69 drives the need to carry out further infrastructure such as the site access and the completion of the A47 link road including the new bridge over the railway early in the process prior to the first occupation of the warehousing units.

3.79 The indicative construction programme is shown in Table 3.9. It is proposed that development would take place in phases with floorspace thresholds or triggers specified for the completion of off-site highways works and elements of the Railport.

Table 3.9: Proposed phasing of the HNRFI development

Phase	From (year)	Indicative description of works
	12 months post-DCO consent	• Discharge of DCO Requirements • Land draw down • Highway technical approvals • Main contractor tender process • Ecological mitigation for construction phase, and tree protection measures • Pre-construction earthworks strategy and main contractor mobilisation
Construction phases		
1	1 – 2	• Site clearance • Junction 2 M69 site access • Junction 2 M69 southern slip roads • A47 link road and new bridge over the railway • Off-site highway improvements • Earthworks to main site and railport • Required utilities diversions and connections • Drainage • Public Right of Way diversions / stopping up • Temporary signage • Landscape and planting works • Building construction commences zone A • Construction of estate roads

2	Year 3 – 4	• Further utilities works • Drainage • Initial rail terminal • Signage • Energy services • Zone F • The construction of estate roads • Completion of warehousing in Zone A • Commencement of construction of warehousing in Zones C and E (rail-connected) • Landscape and planting works
3	Year 5 – 6	• Further utilities works • Drainage • The expanded rail terminal • The construction of estate roads • Construction of warehousing in Zones C and E • Landscape and planting works • Lorry park
4	Year 7 – 8 – Year 15	• Final phase of rail terminal • Further utilities works • Drainage • The construction of estate roads • Construction of warehousing in Zone D • Landscape and planting works
5	Year 9 – 10	• Further utilities works • The construction of estate roads • Construction of warehousing in Zone B • Drainage • Landscape and planting works

Implementation plans

3.80 The potential environmental effects of construction work are assessed in the technical chapters of this PEIR. To further assist the assessment of environmental effects and to provide a clear picture of the measures proposed to protect the environment and local amenity during construction, the DCO application for the Proposed Development will be accompanied by the following documents.

- ***Construction Method Statement*** – explaining how the HNRFI and associated infrastructure would be built.

- ***Construction Environmental Management Plan*** – describing the measures the Applicant proposes to protect the environment of the HNRFI Site and its surroundings

during construction.

- ***Construction Transport Management Plan*** – which will include measures to ensure that construction traffic will not cause an unacceptable increase in traffic on local roads. The plan will include routing restrictions for construction traffic.

- ***Site Waste Management Plan*** – covering the minimisation and management of waste generated during construction.

- ***Community Engagement Plan*** – setting out the arrangements for community liaison and the handling of any complaints during the construction of the Proposed Development.

- ***Landscape and Ecology Management Plan*** – explaining how landscape and planting and habitat protection and enhancement will be undertaken with a view to securing specified landscape visual, ecology and biodiversity benefits.

3.81 It is proposed that drafts of these implementation plans will be submitted with the DCO application and that the draft DCO will include Requirements for the submission and approval of final versions of the implementation plans by the relevant planning authorities after the DCO is 'made'. Each implementation plan will include provisions for its own review in consultation with the relevant planning authorities.

THE RAIL FREIGHT INTERCHANGE IN OPERATION

3.82 As explained earlier in this chapter, the rail connections into the HNRFI have been designed to enable trains to enter the terminal at speeds that minimise the time a train would need to leave the main line. Trains entering the site from either direction would move either directly into the one of the four Railport sidings served by gantry cranes or into one of four reception sidings running alongside the main line. From the reception sidings, trains might continue on to rail-connected buildings via the run-around chord on the northern edge of the Main HNRFI Site.

3.83 Up to 16 train visits a day are provided for.

3.84 Once in the intermodal terminal, gantry cranes or reach stackers would be used to remove and load containers from the train. Gantry cranes would run on rails and move up and down the terminal. They would be powered by electricity for clean and quiet operation. The main benefit of gantry cranes is that they allow a faster operation with more space to stack containers. A reach stacker is a large mobile lift truck which can pick up containers and move around flexibly. While reach stackers are flexible, they require more manoeuvring space.

3.85 Containers unloaded from a train would be transferred by the crane to a temporary stockpile nearby or, more often, transferred directly onto a flatbed trailer pulled by a lorry or a tugmaster yard tractor vehicle. These vehicles would then:

- transport the container directly to one of the B8 buildings on the Main HNRFI Site for processing. From there the contents of the container will be batched and forwarded to customers, who might include manufacturers, retailers and private individuals, using vehicles ranging from HGVs to vans.

- transfer the container to a storage area where it can be held until needed;

- if lorry-hauled, deliver the container to a business elsewhere in the region, generally within 80km of the HNRFI.

3.86 The HNRFI would operate on a 24 hour / seven days a week basis. Staff at the Railport and in B8 buildings would generally work in shifts. the Applicant proposes to implement a site-wide green travel plan to provide the workforce with alternatives to private car use.

Site management - operation

3.87 During the operation of the HNRFI there would be ongoing management of the site to ensure a high quality environment is maintained. These management controls would also apply throughout the construction phase to ensure that existing buildings and occupiers do not experience disruption or disturbance.

3.88 Once completed, the site will be managed by a management company. This organisation will be responsible for ensuring the planned management and maintenance of the site, including shared areas of public realm and unadopted areas.

3.89 A site-wide *HGV Route Management Plan and Strategy* will set objectives and a strategy for the delivery of measures to promote sustainable freight management. It will identify existing local HGV restrictions in the area and specify the proposed routes on the strategic road network that will be promoted for HGV journeys to and from the HNRFI as well as routes through the local villages where HGV movements would be restricted. An HGV signage strategy will be developed in the version of the *HGV Route Management Plan and Strategy* submitted with the DCO application.

3.90 The *HGV Route Management Plan and Strategy* will include a package of measures that will assist in managing and monitoring HGV movements. An enforcement methodology will be developed with the Relevant Planning and Highway Authorities. The measures will raise awareness of the strategy, support efficient operations of the site and encourage positive freight patterns.

Tritax Symmetry (Hinckley) Limited

HINCKLEY NATIONAL RAIL FREIGHT INTERCHANGE

Preliminary Environmental Information Report

Chapter 4:
Site selection and project evolution

January 2022

This document forms a part of a Preliminary Environmental Information Report (PEIR) for the Hinckley National Rail Freight Interchange project.

A PEIR presents environmental information to assist consultees to form an informed view of the likely significant environmental effects of a proposed development and provide feedback.

This PEIR has been prepared by the project promoter, Tritax Symmetry (Hinckley) Limited. The Proposed Development is described in Chapter 3 of the PEIR and is the subject of a public consultation running from 12 January to 9 March 2022.

Details of how to respond to the public consultation are provided at the end of Chapter 1 of the PEIR and on the project website:

http://www.hinckleynrfi.co.uk/

This feedback will be taken into account by Tritax Symmetry (Hinckley) Limited in the preparation of its application for a Development Consent Order for the project.

Chapter 4 ◆ Site selection and project evolution

INTRODUCTION

4.1 The EIA Regulations 2017 [1], state that the ES shall include:

'a description of the reasonable alternatives studied by the applicant, which are relevant to the proposed development and its specific characteristics, and an indication of the main reasons for the option chosen, taking into account the effects of the development on the environment'.

4.2 This chapter explains how the Applicant identified a site for a SRFI. It begins by looking at the regional context and outlines the options that the Applicant considered in terms of alternative locations. It then outlines the consideration that the Applicant is giving, guided by consultation feedback and the EIA process, to the design, size and scale of the development. The chapter concludes with a summary of the options for off-site highway enhancements.

CONTEXT

4.3 Chapter 3 of this PEIR describes the purposes of a SRFI and explains how the HNRFI would operate.

4.4 As paragraph 2.57 of the NPS acknowledges, most intermodal freight interchanges are located in the Midlands and North of England. These are hub regions both for the strategic road and rail networks and the UK economy that these networks serve. These regions also enjoy direct rail access to a range of large ports through which containerised goods pass.

Growth areas in Leicestershire

4.5 Tritax Symmetry Limited has extensive experience in developing logistics schemes in the Midlands and North of England. Working with strategic rail adviser Baker Rose Consulting and drawing upon evidence from the *Leicester and Leicestershire Distribution Sector Study (November 2014)*[2] as updated by the *Wider Market Developments: Implications for*

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[1] *Section 14(2)(d) of the Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (S.I. No. 572 2017)* http://www.legislation.gov.uk/uksi/2017/572/pdfs/uksi_20170572_en.pdf

[2] http://www.google.co.uk/url?sa=t&rct=j&q=&esrc=s&source=web&cd=2&ved=0ahUKEwjw-bTo-JTcAhXOKlAKHfDXCgYQFgg1MAE&url=http%3A%2F%2Fwww.blaby.gov.uk%2FEasySiteWeb%2FGatewayLink.aspx%3FalId%3D11928&usg=AOvVaw1bZG6nZaaACrPyyJ7vcYDA

Leicester and Leicestershire (Jan 2017)[3], and from the *Leicester and Leicestershire Enterprise Partnership's Strategic Economic Plan 2014-20* (March 2014)[4] (LLEP-SEP) , it was established that there remains a significant need for rail-related logistics development in addition to the East Midlands Gateway development close to East Midlands Airport and the M1 motorway. This need is considered in Chapter 5 of this PEIR.

4.6 As shown in Map 4.1 (overleaf), the LLEP-SEP identifies five priority Growth Areas as follows:

- *Growth Area 1 (GA1)* - the Leicester urban area (based on the Waterside and Abbey Meadows Strategic Regeneration Area);
- *Growth Area 2 (GA2)* - East Midlands Enterprise Gateway (based on the East Midlands Gateway Strategic Rail Freight Terminal);
- *Growth Area 3 (GA3)* - Coalville Growth Corridor (based on improving the A511 corridor to bring forward already-planned developments);
- *Growth Area 4 (GA4)* - Loughborough (based on the Loughborough University Science and Enterprise Park for bio and pharmaceutical research and development);
- *Growth Area 5 (GA5)* – South West Leicestershire, in which the proposed HNRFI is situated.

4.7 According to the LLEP-SEP (pp 48-9):

'The South West Leicestershire Growth Area offers a unique combination of key commercial and employment hubs. These provide the opportunity to harness major employment and housing opportunities for Leicester and Leicestershire. The M1 corridor (including the M69/M1 Junction 21 location) and A5 corridor are crucial economic areas in their own right, with established and expanding services, distribution, retail and leisure roles providing thousands of jobs for the sub-region.

The area is also the major gateway to the Leicester Urban Area. Major Sustainable Urban Extensions and Strategic Employment Sites can create 9,000 new homes and 21 hectares of commercial development at New Lubbesthorpe, Earl Shilton and Barwell SUEs.

The success of these significant opportunities depends largely on the delivery of supporting infrastructure. Such investment, alongside other key initiatives such as the major upgrading of the Nuneaton-Felixstowe freight line, will also open up longer term growth potential in this area.'

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[3] http://www.google.co.uk/url?sa=t&rct=j&q=&esrc=s&source=web&cd=1&ved=0ahUKEwi2wKKA-pTcAhWRbVAKHTsMCgEQFggvMAA&url=http%3A%2F%2Fwww.harborough.gov.uk%2Fdownload%2Fdownloads%2Fid%2F3102%2Fwider_market_developments_final_report_jan_17pdf.pdf&usg=AOvVaw1p5FvtNG2n_80Lk4OM2PFP

[4] https://www.llep.org.uk/wp-content/uploads/2015/03/SEP_-_full_document.pdf

Map 4.1: Growth areas identified in the Strategic Economic Plan 2014. The route of the Felixstowe to Nuneaton strategic rail freight route (F2N) across Leicestershire is shown diagrammatically as a red line

4.8 The importance of the Felixstowe to Nuneaton (F2N) strategic rail freight route improvements is recognised in both *the Leicester and Leicestershire Strategic Distribution Sector Study 2014* [5] and the *LLEP-SEP*, with the latter commenting in para. 3.49 that:

[5] The importance of the F2N strategic rail freight route is acknowledged similarly in the 2021 update of this report entitled *Warehousing and logistics in Leicester and Leicestershire: managing growth and change* (GL Hearn, April 2021): https://www.nwleics.gov.uk/files/documents/warehousing_and_logistics_in_leicester_and_leicestershire_managing_growth_and_change_april_2021/Warehousing%20Report%20Leics%20FINAL%2027%2004%2021%20V2%20%28Corrected%29.pdf

'Freight connectivity will be substantially enhanced by the upgrade of the Nuneaton-Felixstowe freight railway line which will significantly increase freight capacity through accommodating longer trains up to 750m and larger shipping containers. This route passes through the Growth Area'.

4.9 In May 2015 the LLEP published *Logistics & Distribution Sector Growth Action Plan* [6] which states on page 16 under the heading Rail Interchange:

'The LLSDSS researched the baseline position, key challenges and plans for growth within the LLEP area and established that the development of new, ***commercially-attractive sites directly served by rail is of upmost importance for Leicestershire*** *to remain one of the strategic locations for Logistics and Distribution. Currently Leicester and Leicestershire remains the 'location of choice' for national distribution centres (NDCs) and regional distribution centres (RDCs) with an estimated 7:3 ratio between the two. This ratio is significant as it demonstrates that the South East Midlands, of which Leicestershire is part, is a favoured location for national distribution operations due to its central location and that a driver can take inbound and / or outbound cargo from both deep-sea and Dover Straits ports within a shift' (*original emphasis).

4.10 The Applicant recognised that an SRFI on the F2N strategic rail freight route ideally within GA5, South West Leicestershire Growth Area, with good access to the M69 and M1 motorways and the A5 corridor, would provide optimal multi-modal connectivity and a nodal point for the expressed need for future growth.

4.11 Network Rail is implementing a phased series of improvements to this route, which will increase the maximum train length from 600m, the standard intermodal train length, to 775m. The railway between Felixstowe and Nuneaton was upgraded in 2014 to the 'W10 gauge', enabling containers up to 2.9m high to be carried on standard flat wagons from Felixstowe to the Midlands directly. This means that intermodal trains can travel to the region from all the UK deep sea ports and every major city in Britain with standard wagons carrying 2.9 metre high containers.

4.12 West of Leicester the railway carries only a low number of passenger trains per hour, providing substantial capacity for freight having allowed for the Midland Engine's aspirations for significantly increased passenger services [7].

SITE OPTIONS APPRAISAL CRITERIA

4.13 Paragraphs 4.83 – 4.89 of the NPS provide specific policy guidance on the assessment principles for SRFI, including their function, locational requirements and scale and design.

[6] https://www.llep.org.uk/strategies-and-plans/sector-growth-plans/distribution-and-logistics-sector/

[7] The Midlands Engine is a coalition of Councils, Combined Authorities, Local Enterprise Partnerships (LEP), Universities and businesses across the region, working to build a collective identity that will enable its members to present the Midlands as a competitive and compelling offer that is attractive to inward investment.

This policy advice was taken into account in the Applicant's assessment of locations and design options.

4.14 At the outset, the Applicant's strategic rail adviser Baker Rose Consulting examined in engineering terms the potential locations on the rail network in Leicestershire that might present opportunities for a SRFI in locations on or readily connectable to the F2N strategic rail freight route, using a combination of professional knowledge of the network, local knowledge, rail network maps and aerial photographs. Along this route and on potential short spurs from it, seven potential rail locations for a SRFI were identified. These are shown in Map 4.2.

4.15 The following criteria and principles were employed in the appraisal of the seven location options.

Rail

- Rail access to F2N strategic rail freight route to give rail connectivity to major deep-water ports of Felixstowe, London Gateway, Liverpool and Southampton, maximising opportunities for modal shift from road to rail.
- Ability to receive 775m long freight trains.
- Ability for trains to connect to the SRFI site from more than one direction.
- Availability of train paths that avoid conflicts with passenger services, with capacity for handling at least four freight trains per day.

Road

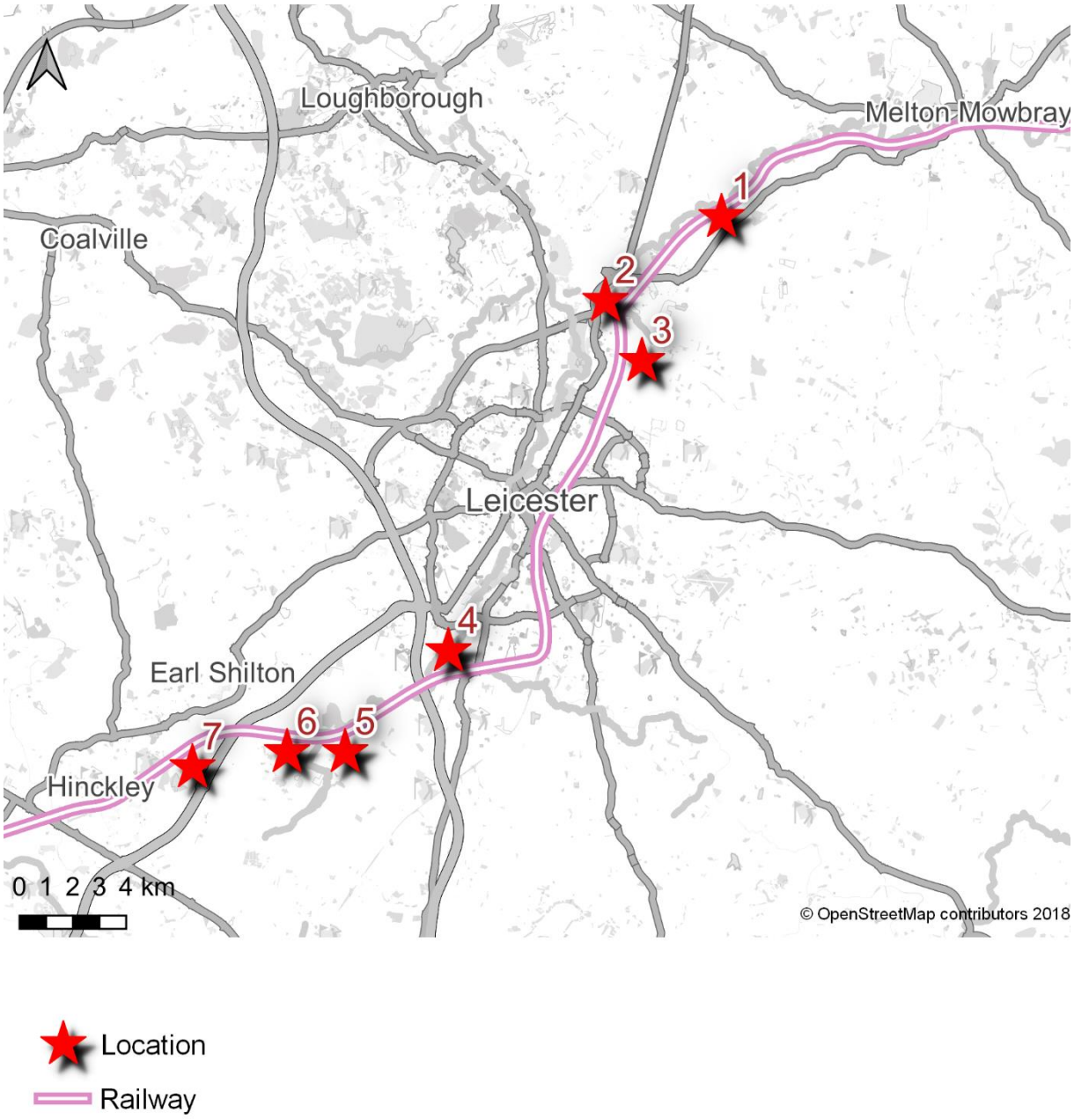
- Access to the national motorway network.
- Access to other routes in the strategic highway network.
- Access route which would not cause disturbance to neighbouring and nearby land uses.

Amenity and environmental

- Avoidance of existing residential properties and neighbourhoods and sites allocated for housing in local plans.
- Avoidance of areas likely to flood (flood zones 2 and 3).
- Avoidance of significant harm to protected environmental assets including sites and features of landscape, ecological and cultural heritage significance.
- Minimising loss of best quality soils.
- Avoiding significant policy conflict.

(List continues after Map 4.2)

Map 4.2: Location plan of the seven potential SRFI locations appraised by the Applicant



1. **Brooksby**
2. **Syston Junction / Fosse Way**
3. **Barkby Lane**
4. **Whetstone**
5. **Littlethorpe**
6. **Croft**
7. **Hinckley / Burbage**

Commercial and economic

- A broadly level topography that minimises the need for excessive ground works.
- A tract of land largely free of built development, extending to a minimum of 60 hectares and capable of accommodating large scale warehouse development.
- Compatibility with the objectives of the LLEP-SEP, particularly the Key Areas of Opportunity designated Growth Areas.
- Compatibility with existing infrastructure.
- Avoidance of conflicts with existing rail terminals.
- The demand profile for users and occupiers.
- Proximity to a labour force.
- Potential availability of land.

ASSESSMENT OF SITE OPTIONS

4.16 The seven potential SRFI site options or areas of interest identified will now be described in turn. A location plan is provided for each option with the general core area of the location indicated by a mauve circle of standard size. These circles are diagrammatic only and provide no indication of the area or shape of land that would be required or available should a SRFI be proposed at that location.

1. Brooksby

4.17 This option lies on farmland in the valley of the River Wreake to the west of Brooksby. The area of interest reviewed is largely in the Borough of Melton, although the municipal boundary with the Borough of Charnwood lies just to the west of Hive's Farm (see Map 4.3).

Access

4.18 The A607 is a single-carriageway road, connecting to the dual carriageway A46 ring road on the northern edge of Leicester. The site is c. 17 km from the nearest motorway junction - M1 Junction 21A to the west of Leicester that serves traffic to and from the south only - and is c. 22 km from M1 Junction 22, which provides access in both northerly and southerly directions.

Rail link

4.19 The F2N strategic rail freight route passes close to the A607 Melton Road, the main road between Leicester and Melton Mowbray.

Flood risk

4.20 Land on both sides of the railway is in the functional flood plain of the River Wreake with extensive areas in Flood Zone 3, meaning that it has been assessed by the EA as having a 1 in 100 or greater annual probability of river flooding. The NPS (NPS paragraphs 5.105-

5.109) only supports infrastructure development in Flood Zone 3 if a project constitutes 'essential infrastructure', affords wider sustainability benefits and there is no acceptable alternative site.

Heritage

4.21 Listed buildings of architectural and historic interest in Brooksby include St Michael's Church and Brooksby Hall (both grade II*). Brooksby's grade II listed railway station closed in 1964.

Landscape

4.22 The location is not subject to any protective landscape designations

Ecology

4.23 Sections of the River Wreake and its banks are designated as a local wildlife site.

Land use

4.24 Hive's Farm and Hall Farm comprise the principal groups of buildings inside the area of interest. Immediately to the east of the area of interest is Brooksby Melton College, an agricultural college.

Soil quality

4.25 According to Defra's system of agricultural land classification. Most of the land to the north of the A607 is grade 4 – poor quality agricultural land, with some grade 2 land (very good quality) close by.

Infrastructure

4.26 A pylon-mounted electricity transmission line crosses the location on a north-west to south-easterly alignment to the east of Hive's Farm.

Topography

4.27 The land to the south-east rises to a low ridge, along which the A607 runs. The railway itself is on a low embankment.

Amenity

4.28 The villages of Thrussington and Rearsby lie at a distance of 1.5 km to the west and south-west respectively. A public footpath runs through fields between Brooksby and Rearsby.

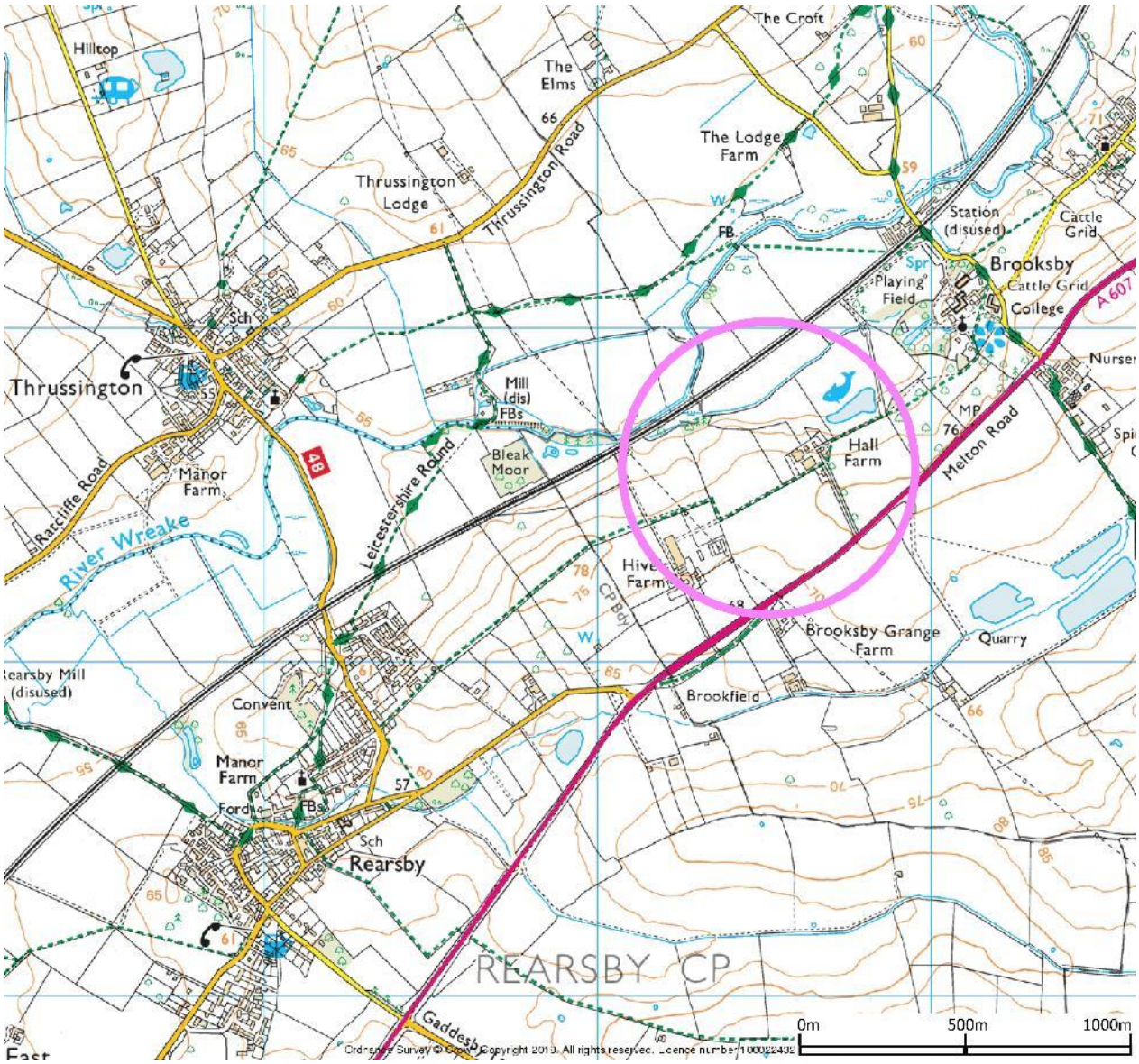
Policy

4.29 The area to the west of Hive's Farm is protected as countryside in the Charnwood Local Plan (adopted 2004).

LEP Growth Area

4.30 The site is outside of the identified LLEP Growth Areas.

Map 4.3: Option 1 – Brooksby



4.31 The principal reasons why Brooksby is not the preferred location are its propensity to flood, its relatively poor access to the strategic highway network and its location outside of the identified LLEP Growth Areas. Such a remote location would not meet occupier

requirements for direct strategic road access, adding to road haulage operating costs and the associated environmental impacts.

2. Syston Junction / Fosse Way

4.32 The site is in Charnwood Borough. Charnwood Edge Business Park lies across the A46 to the north-west, and lakes used by the Roundhill Sailing Association and for angling lie immediately to the south-east. The location also features a cluster of industrial buildings at Syston Mills and a community sports pitch used by Syston Cricket Club to the west of Fosse Way.

Access

4.33 The A46 dual carriageway bounds the site to the west and the A607 to the north. The site is 11km from M1 Junction 21A and 16 km from M1 Junction 22, with dual carriageway links via the A46 and A50. The Fosse Way – a Roman Road and nowadays a secondary road at this location - crosses the middle of the site and provides a link from the A46 to the western part of Syston.

Rail link

4.34 The second option is located on the north-western edge of Syston, on land inside the 'Y' formed where the F2N and Leicester to Hinckley railways branch.

Flood risk

4.35 The River Wreake runs inside the north-western and northern boundaries of site and the whole site is in Flood Zone 3, having the highest flood risk.

Heritage

4.36 Syston is a historic town with numerous listed buildings in its centre. Several sites of archaeological interest have been identified along the A46 corridor to the west of the site, and the original road bridge over the River Wreake, next to the modern bridge serving the A46, is grade II listed.

Landscape

4.37 The site is not subject to any statutory landscape designation.

Land use

4.38 The site itself is level and is largely in agricultural use.

Soil quality

4.39 Most of the locality is rated as grade 4: poor quality in Defra's agricultural land quality system.

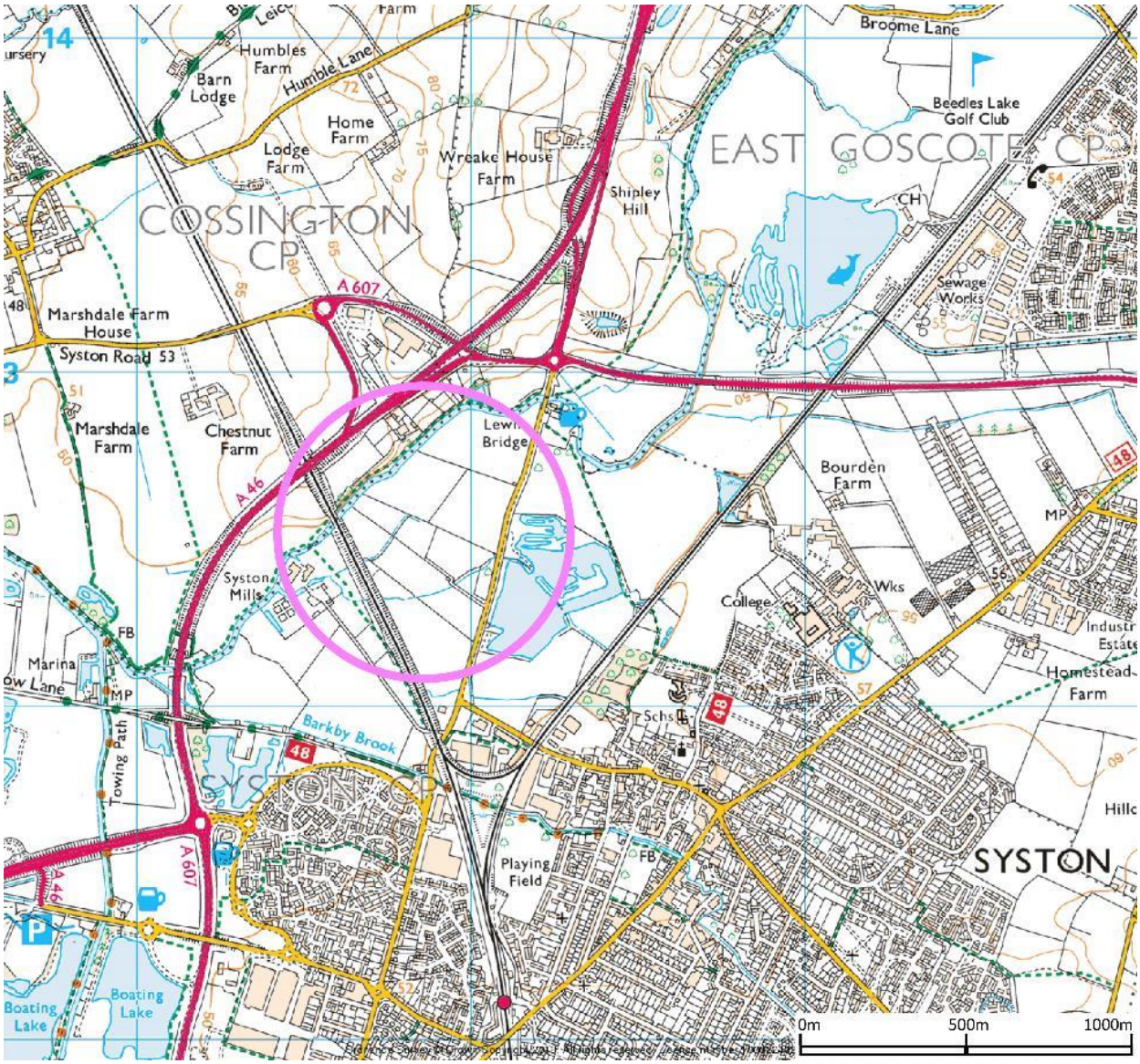
Policy

4.40 The site is designated as countryside in the Charnwood Local Plan LLEP Growth Area.

LEP Growth Area

4.41 The site lies outside the identified LLEP Growth Areas.

Map 4.4: Option 2 - Syston Junction / Fosse Way



4.42 In view of the site's relative remoteness from the motorway network, its location outside a Growth Area and the adverse flood risk the location was not investigated further.

3. Barkby Lane

4.43 The site is in Charnwood Borough, between the residential suburb of Thurmaston to the west and the villages of Barkby and Barkby Thorpe to the north-east.

Access

4.44 Road access is gained via local roads to the dualled A607 Newark Road and thence to the M1 motorway via the A46 northern ring road. By the A607 / A46 route the site is 14 km from M1 Junction 21A and 19 km from M1 Junction 22.

Rail link

4.45 A spur from the F2N strategic rail freight route would be required to provide access to this area. There is restricted access to the existing railway.

Flood risk

4.46 An extensive area of the site is in Flood Zone 2, assessed by the EA as having between a 1 in 100 and 1 in 1,000 annual probability of river flooding.

Heritage

4.47 There are areas of archaeological interest on the site. The location is otherwise free of heritage constraints.

Landscape

4.48 There are trees subject to preservation orders in the area of interest.

Land use

4.49 The location comprises an area of open and broadly level farmland to the south of Syston.

Soil quality

4.50 The farmland itself is rated as grade 2: very good quality and 3: good to moderate quality in Defra's agricultural land classification system.

Amenity

4.51 There are residential neighbourhoods to the west and north-east, giving rise to amenity concerns. Apart from Barkby Lane there are no public rights of way.

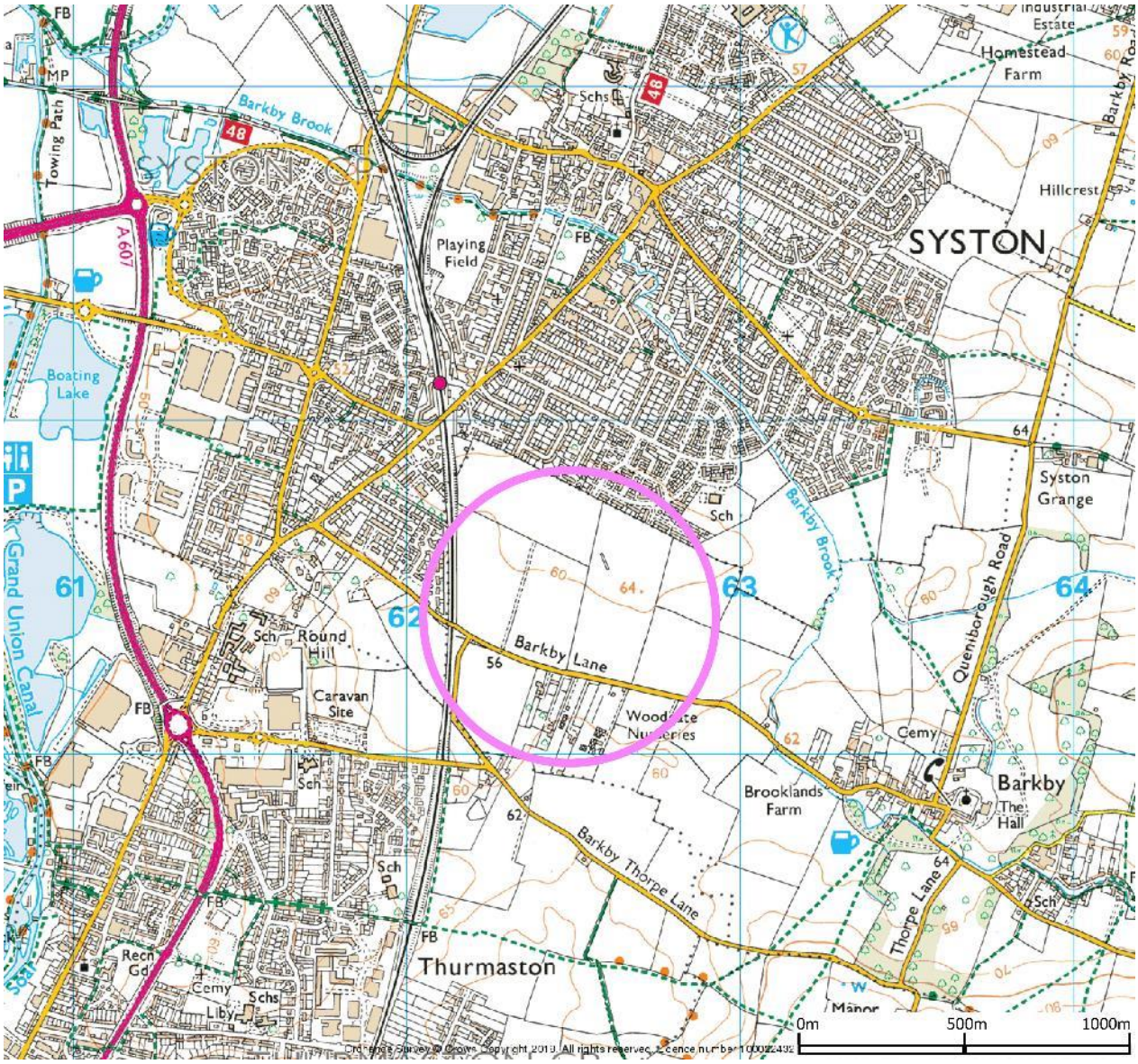
Policy

4.52 The Charnwood Local Plan identifies the land as countryside in a green wedge – a local plan designation that seeks to maintain open land between urban settlements, so preserving their separate identity. The Barkby Lane site has been identified as a potential site for 960 houses in the current review of the Charnwood Local Plan.

LEP Growth Area

4.53 The site lies outside of the LLEP's identified Growth Areas.

Map 4.5: Option 3 – Barkby Lane



4.54 In view of its poor road access, which would not suit occupier requirements, its proximity to housing and the restricted access to the existing railway, the Barkby Lane site was not selected as the preferred location.

4. Whetstone

4.55 This option lies on the northern side of the F2N strategic rail freight route in Blaby District on the southern edge of Leicester. Whetstone and Blaby lie to the south and the suburb of Glen Parva is to the north. The River Sence forms the northern edge of the site with the Grand Union Canal a short distance beyond. Enderby Road industrial estate lies to the west.

Access

4.56 M1 Junction 21, into which the M69 motorway connects, lies 2.5 km to the north-west as the crow flies, but access from the site to this Junction would at first be by single-carriageway urban roads - the B582 Enderby Road to the west or the A426 Leicester Road to the east - which connect respectively to the B4114 and A563 dual-carriageways on the approach to M1 Junction 21.

Rail link

4.57 The existing railway passes the site on an embankment, presenting engineering and operational challenges in terms of terrain and gradient.

Flood risk

4.58 The site itself is limited in size and lies in Flood Zone 3.

Heritage

4.59 The Grand Union Canal to the north of the River Sense is a linear Conservation Area, but there is little else of acknowledged heritage interest in the immediate vicinity. The closest listed buildings are to the south in Whetstone and Blaby and to the west on the edge of Enderby.

Landscape

4.60 The location is not subject to any protective landscape designation.

Ecology

4.61 Narborough Bog SSSI and nature reserve lies under 1 km to the west and there is a Local Nature Reserve (LNR on the western edge of Glen Parva, c. 0.5 km to the north.

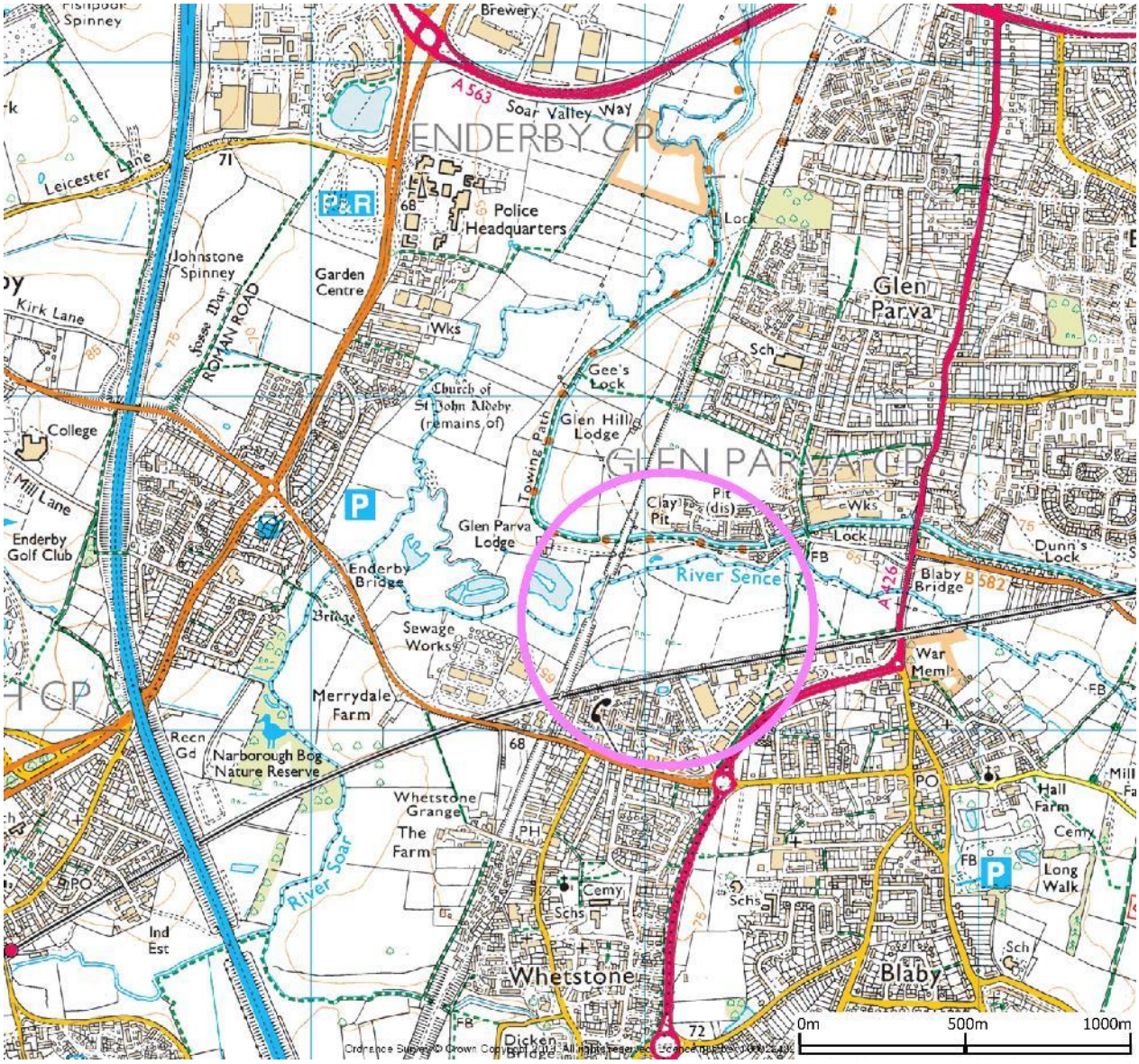
Soil quality

4.62 The location is classified as grade 2 and 3 agricultural land (very good and good to moderate quality) and is used for grazing.

Amenity

4.63 The location is close to residential neighbourhoods.

Map 4.6: Option 4 – Whetstone



Policy

4.64 The Whetstone site is identified as a green wedge in the adopted Blaby District Local Plan. Development would cause the urban coalescence of adjacent settlements, in conflict with the purpose of the green wedge policy.

LEP Growth Area

4.65 The site lies in the LLEP's South-West Leicestershire Growth Area.

4.66 In summary the site is limited in size and lies in Flood Zone 3. It is close to residential neighbourhoods and would cause the urban coalescence of adjacent settlements, in conflict with the purpose of a green wedge policy in the Local Plan. For these reasons the option was not selected as the preferred location.

5. Littlethorpe

4.67 The area of interest is an area of farmland south of Narborough to the south-west of Leicester. The village of Littlethorpe lies to the north-east and the larger settlement of Cosby to the south-east.

Access

4.68 Road access is restricted, being via the B4114 Coventry Road towards M1 Junction 21, a distance of c. 7 km. From the site, the first 2.5 km of this route is single carriageway and for much of its route this road passes through urban residential areas, raising amenity concerns.

Rail link

4.69 The F2N strategic rail freight route lies on the north-western edge of the site. Rail access is likely to be achievable only as a spur with a single aspect access.

Flood risk

4.70 The River Soar passes close to the northern edge of the site. The site has an extensive network of drainage ditches that generally follow field boundaries. Although a central area of the site is in Flood Zone 1 (i.e. land with a low probability of flooding), much of the remainder is in Flood Zones 2 and 3, placing a significant restriction on the potential for development.

Heritage

4.71 The area is free of heritage designations. The centre of Narborough to the north-east contains a Conservation Area and several listed buildings.

Land use

4.72 The site comprises a level area of open farmland. Existing development on the site is limited to two farms, Fulmore Farm in the south-west and Lodge Farm in the north-east.

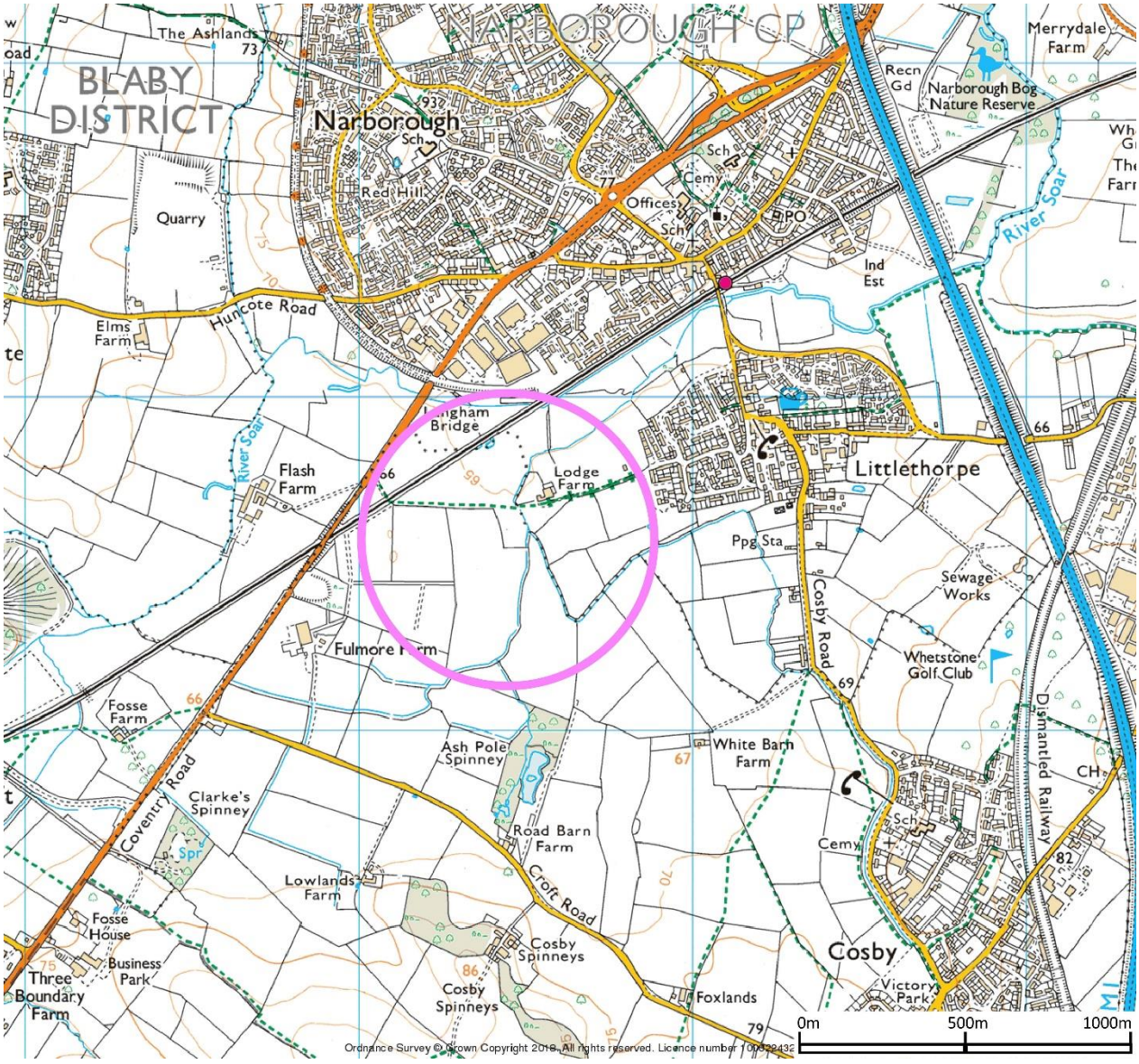
Soil quality

4.73 The farmland is rated by Defra to be a combination of grade 3 (good to moderate) and grade 4 (poor quality).

Amenity

4.74 The area is crossed by a footpath running westward from Littlethorpe village.

Map 4.7: Option 5 – Littlethorpe



Policy

4.75 The area is subject to countryside protection policies in the adopted Blaby District Local Plan.

LEP Growth Area

4.76 The site is inside the LLEP's South-West Leicestershire Growth Area.

4.77 For reasons relating to the adequacy of the highway network, the impact upon residential amenity and the limited area of land available in Flood Zone 1, this site was excluded from further consideration.

6. Croft

4.78 This option lies in the Soar valley, in Blaby District. The village of Croft lies to the east and Stoney Stanton to the west.

Access

4.79 Road access would be via the B4114 Coventry Road towards M1 Junction 21, a distance of c. 9.5 km. From the site, the first 5 km of this route is a single carriageway and for much of its route this road passes through urban residential areas, raising potential amenity concerns.

Rail link

4.80 The site is beside the F2N strategic rail freight route. The railway passes the site in a combination of cutting and embankment with only a limited at-grade section in between. Rail access might need to be by means of a single spur.

Flood risk

4.81 The River Soar meanders across the site and is fed by minor tributaries and a swathe of land along the river corridor is in Flood Zone 3, indicating a high level of flood risk.

Heritage

4.82 There are no designated features of historic or architectural interest at the site but there are several in the wider landscape and a Conservation Area at Croft, to the north-east.

Ecology

4.83 There are also two SSSIs – Croft Pasture and Croft Hill SSSIs, to the west and north of the village.

Land use

4.84 There are several farmsteads on the site and these would be displaced as a consequence of the development.

Soil quality

4.85 The farmland is rated by Defra to be a combination of grade 3 (good to moderate) and grade 4 (poor quality).

Infrastructure

4.86 High voltage electricity transmission lines cross from north-west to south-east over the centre of the site and there is also a small wastewater treatment works at the centre of the site, although a SRFI could be developed around these features. A major British Gas pipeline crosses the northern half of the site broadly from south-east to north-west, and the Blaby District Local Plan identifies a broad hazard consultation zone along the pipeline corridor.

Topography

4.87 This is an extensive area of level and low-lying open farmland.

Amenity

4.88 The village of Croft lies to the east and Stoney Stanton to the west, connected by a footpath that crosses the area of interest.

Policy

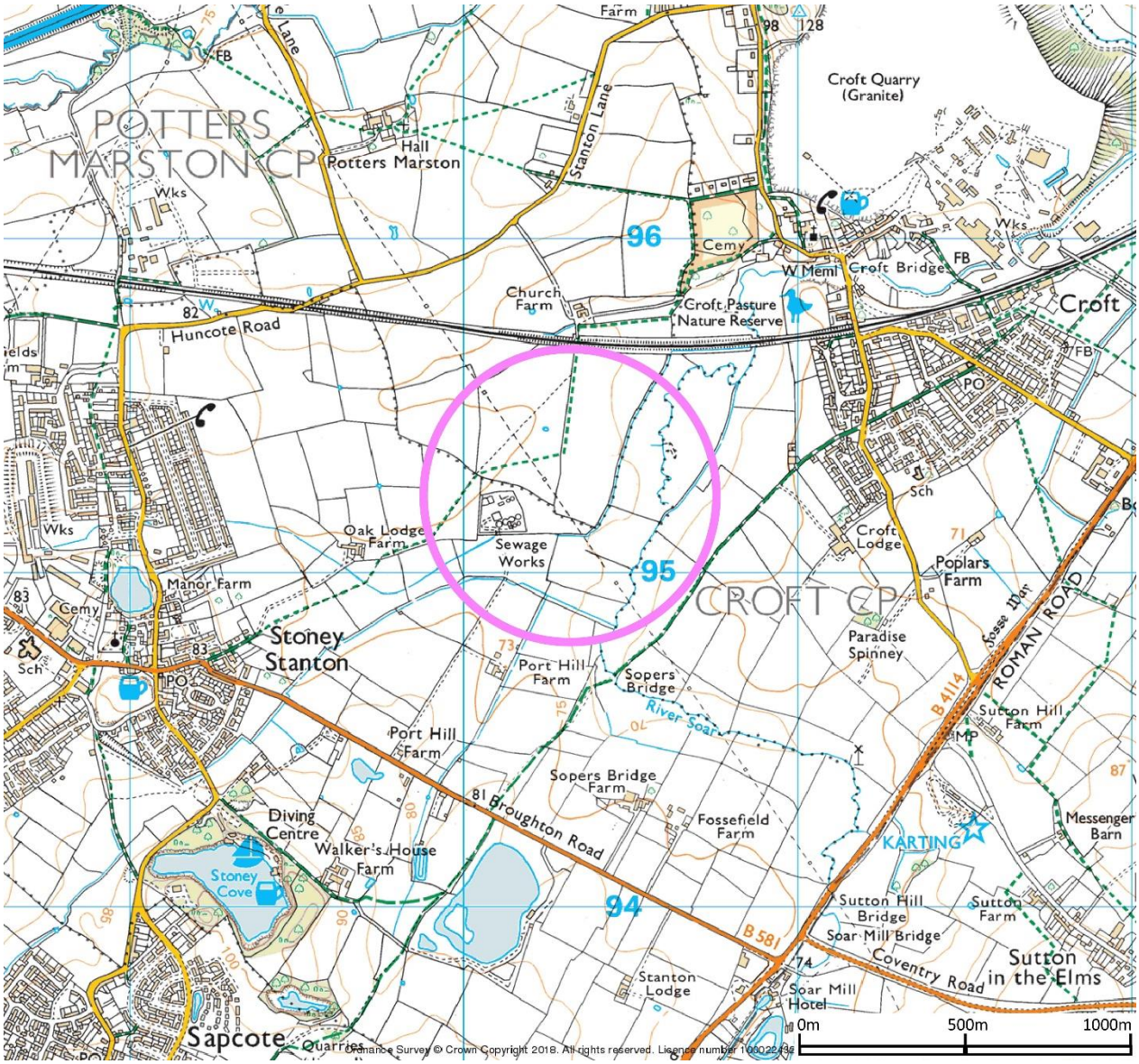
4.89 The site is subject to countryside protection policies in the adopted Blaby District Local Plan. The site is 'pinched' between neighbouring villages.

LEP Growth Area

4.90 The site is in the LLEP's South-West Leicestershire Growth Area.

4.91 In view of the limited road and rail access, flood and pipeline constraints and the fact that the site is 'pinched' between neighbouring villages this option was not pursued as a preferred option.

Map 4.8: Option 6 – Croft



7. Hinckley/Burbage

4.92 This option lies at the south-western end of the Applicant's search corridor, in Blaby District. Settlements in the wider locality include Burbage and Hinckley to the south-west, Barwell and Earl Shilton to the north and Stoney Stanton and Sapcote to the east.

Access

4.93 The M69 motorway forms the eastern boundary of the site and links the M6 motorway and A5 to the south-west with the M1 motorway to the north-east. M69 Junction 2 lies at the southern edge of the site and affords potential for direct access to the motorway network. However, M69 Junction 2 is currently a limited access junction and lacks slip-

roads to and from the M69 motorway southwards towards Coventry and the M6 motorway. M69 Junction 2 is capable of being improved in line with the LLEP Growth Strategy to provide better access to the M69 motorway.

Rail link

4.94 The site is beside the F2N strategic rail freight route. The railway is almost at grade with the site and affords a long frontage, enabling 'on-off' sidings to be constructed if required.

Flood risk

4.95 The site is almost entirely in Flood Zone 1, in which the probability of flooding is low.

Heritage

4.96 The majority of designated heritage assets in the wider area comprise listed buildings clustered in the historic cores of local settlements. These include the Church of St Mary in Barwell, 1.8 km to the north-west, a Grade I listed building.

Ecology

4.97 The site itself is free of environmental designations. The Burbage Wood and Aston Firs SSSI lies close to the south-west. This SSSI is designated for its mixed ash, oak and maple woodland and adjoins the Burbage Common and Woods Local Nature Reserve (LNR).

Land use

4.98 The site comprises an extensive area of level and open farmland. Within the area of interest are a few farmsteads.

Soil quality

4.99 The farmland is largely classified as grade 3: (good to moderate quality).

Amenity

4.100 The closest settlements are the village of Elmesthorpe to the north and traveller and mobile home settlements to the south. The site is crossed by a public highway, Burbage Common Road, and by a network of footpaths, two of which cross the railway by means of pedestrian level crossings.

Policy

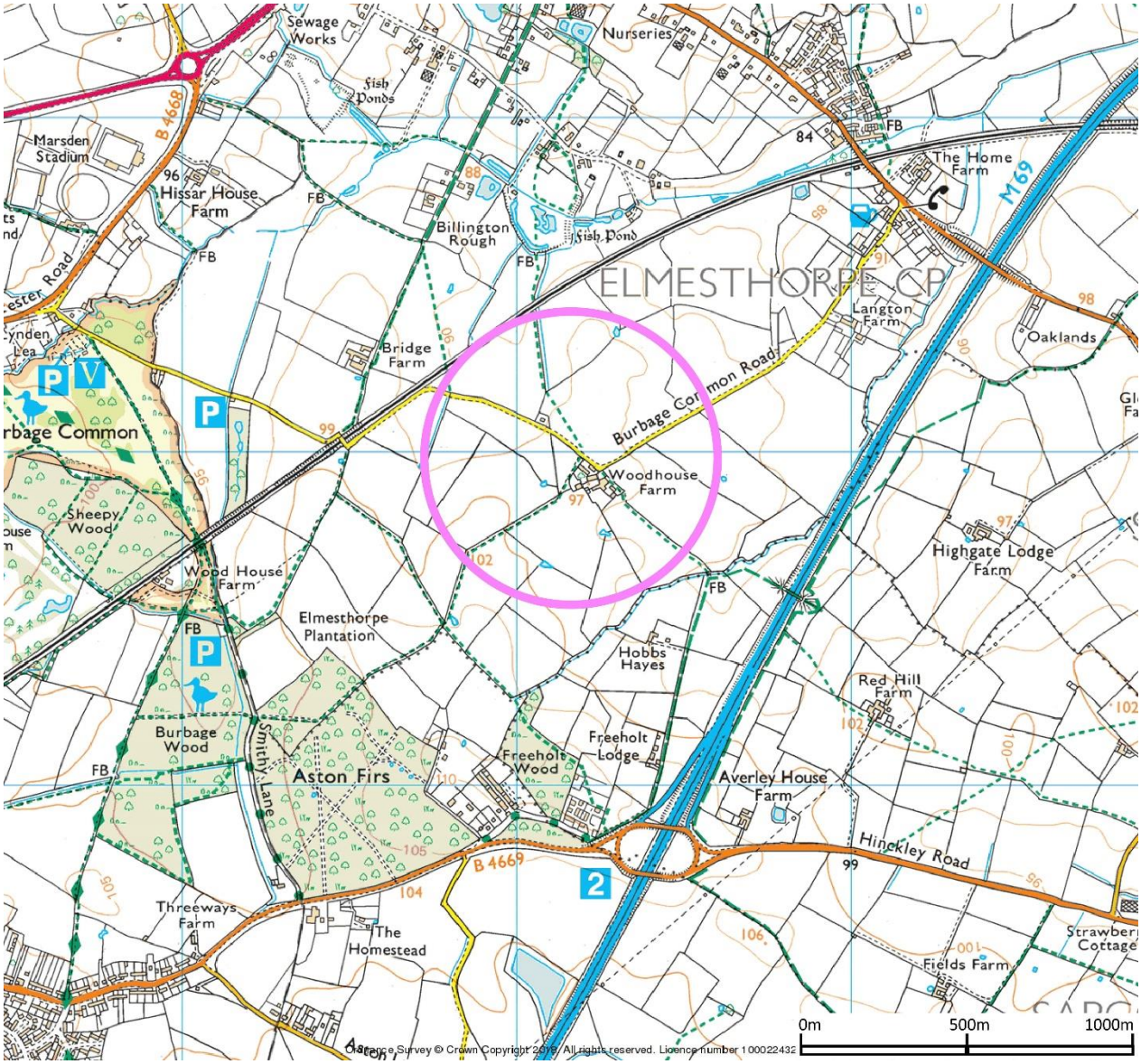
4.101 The site is subject to countryside protection policies in the adopted Blaby District Local Plan.

LEP Growth Area

4.102 The site is in the LLEP's South-West Leicestershire Growth Area and is also lies within 'Key Opportunity Area A' for rail and road-linked distribution hubs in the LLEP-SEP.

4.103 For this combination of reasons, the site went forward for further assessment.

Map 4.9: Option 7 – Hinckley / Burbage



ASSESSMENT AND THE CHOICE OF SITE

4.104 By definition a SRFI needs direct rail access or spurs, which constrains the site search to railway corridors that were identified originally by the Victorian engineers and surveyors who designed most of the UK's railway network. To optimise locomotive performance and to minimise the need for expensive cuttings, tunnels, embankments and bridges, these engineers favoured level routes in low-lying river valleys. Railway lines were protected from flood risk through a combination of clever routing and the use of low embankments.

4.105 This legacy is clearly evident in the Applicant's review of potential SRFI sites along the F2N strategic rail freight route in Leicestershire. Most of the trackside sites that were reviewed are in areas at high risk of flooding, rendering them unsuitable for development. Only one of the potential locations reviewed presented the opportunity to avoid land in Flood Zones 3 and 2 – option 7: Hinckley/Burbage.

4.106 Aside from its low flood risk, Option 7 was considered to offer an optimum balance of advantages, including:

i). an ample area of open level land;
ii). sufficient at-grade rail frontage for rail connections to the main line, and the ability to accommodate trains up to 775m in length;
iii). the potential for direct road access to the strategic highway network from M69 Junction 2, with scope to add southbound slips to the Junction;
iv). separation from existing residential settlements sufficient to avoid significant adverse effects on noise and visual amenity after mitigation;
v). a comparatively low level of environmental constraint, with no designated features of landscape, ecological or cultural heritage interest inside the site.
iv). a location within the LLEP's designated South-West Leicestershire Growth Area.

4.107 The Applicant commissioned environmental consultants EDP to undertake an environmental appraisal of the Hinckley/Burbage option, including landscape, biodiversity and heritage considerations. Initial sketch schemes for a potential SRFI included land to the west and east of the M69 motorway. However, EDP considered that development to the east of the M69 motorway would have a greater effect on landscape character and visual amenity than the land contained by roads, the F2N strategic rail freight route and woodland to the west.

4.108 On this basis, the Applicant concluded that the site for the SRFI should be focused upon land between the railway and the M69 motorway, which affords the best opportunity to bring forward a SRFI meeting the policy requirements of the NPS and the practical potential to deliver a site of the scale required. Specifically the site:

- could provide an 'in-out' rail connection to a line accessible from a range of the UK's leading freight ports, with potential for future electrification;

- would be capable of handling over four trains per day;
- would be able to accommodate trains up to 775m long with minimal shunting;
- would offer ample space for an intermodal terminal for rail handling and storage;
- could include a number of rail connected or rail accessible buildings with all building users having access to the intermodal rail terminal.

MASTER PLANNING OPTIONS FOR THE MAIN HNRFI SITE

4.109 Having identified a preferred location, the Applicant has tested a range of technology, design and layout options for the site, having regard to the following requirements identified in Chapter 4 of the NPS, including:

- criteria for 'good design' for national network infrastructure (NPS pp. 36-37);
- climate change adaptation (NPS pp. 37-39);
- pollution control and other environmental protection regimes (NPS pp. 39-41);
- the identification and mitigation of potential statutory nuisances (NPS p. 41);
- safety, security and health (NPS pp. 41-44).

4.110 Aspects under review include:

- layout options for specific parts of the site, including rail connectivity and accessibility options, the road junction on the M69 motorway, landscape and amenity areas, public rights of way and roads including the Burbage Common Road bridge over the railway, drainage and environmental mitigation;
- technology options including methods of unloading, loading and transporting freight containers around the site. At a time of technological change, the Applicant wants to ensure that the HNRFI is as far as possible 'future-proofed' and capable of serving the Midlands economy effectively in the long term;
- off-site road access;
- measures to protect local residential and environmental amenity, taking into account factors including landscape and visual effects, measures to control noise and light pollution, biodiversity, the protection of the water environment and the provision of open space and amenity routes through and around the HNRFI.

- scale and phasing options for the development, in part reflecting market intelligence on the size of buildings logistics occupiers on the proposed HNRFI are likely to require.

The role of master-planning

4.111 As explained in Chapter 1: *Introduction* of this PEIR, the DCO application will seek consent for development parameters in keeping with the Rochdale Envelope approach, as opposed to detailed building designs and layouts. However, the Applicant has reviewed numerous illustrative master plan layouts to test the commercial potential of the site, its road and rail access arrangements, the likely effects on the local environment and the ability of the site to accommodate appropriate environmental mitigation.

4.112 An illustrative master plan provides consultees with a representative picture of what is proposed. Once fixed it will inform the definition of physical development parameters – maximum floor areas, building heights, and corridors for roads and landscape works, etc – that will inform the assessment of environmental effects. The final parameters will be set out in the draft DCO.

4.113 An early consideration in the master-planning exercise was to understand in detail the constraints and opportunities that the site offers. The findings of the site investigation and appraisal work undertaken to date are described in the baseline conditions sections of the environmental topic-based chapters of this PEIR. Considerations influencing the master-planning of the site include the following.

i). ***Terrain*** – although to casual inspection the Main HNRFI Site appears broadly level, it slopes gently downhill from a high point of 110m Above Ordnance Datum (AOD – i.e. above sea level) adjacent to M69 Junction 2 to a low point of 83m AOD beside the railway at the northern end of the Main HNRFI Site. This has implications both for the development of large B8 buildings, which require level single-height floors, and for railway sidings, for which a level surface is desirable to help prevent freight wagons from rolling under the influence of gravity.

ii). ***Existing access and rights of way*** – the Main HNRFI Site is crossed by one public highway – the C-classified Burbage Common Road. This is a single-track country lane that provides one of two routes between Elmesthorpe and Burbage Common. As well as serving homes, farms and businesses within the Main HNRFI Site, Burbage Common Road serves as an amenity route for walkers, cyclists and horse riders in conjunction with a network of footpaths and bridleways that generally follow field boundaries on the site.

iii). ***Proposed access to the development*** – both by rail from the Leicester to Hinckley railway, and by road.

iv). ***Residential amenity*** – taking into account considerations including noise, visual outlook and air quality. Residential properties outside but in the vicinity of the Main HNRFI Site include:

- Elmesthorpe village, a ribbon development along the B581 Station Road with additional dispersed development along the unadopted Bridle Path Road and Billington Road West to the south-west of the main village;

- Mobile home, and gypsy and traveller accommodation on several sites off Smithy Lane, close to M69 Junction 2;

- Free-standing farmsteads including Bridge Farm, adjacent to the bridge that carries Burbage Common Road over the railway, and Highgate Lodge Farm, Red Hill Farm and Averley House Farm to the east of the M69 motorway.

v). ***Ecology and biodiversity*** – the master-planning of the site has been informed by extensive ecological surveys, described in Chapter 12: *Ecology and biodiversity* of this PEIR.

vi). ***Cultural heritage and archaeology*** – although published records indicated that the Main HNRFI Site is of comparatively limited historic interest, in 2018-19 the Applicant undertook extensive trial-trenching of the Main HNRFI Site in order to confirm its archaeological potential. The outcome of this site investigation work is described in the Chapter 13: *Cultural heritage and archaeology* of this PEIR.

vii). ***Landscape*** – viewpoints were identified at an early stage in the planning and assessment process to help the likely landscape and visual effects of the proposed development to be understood and reflected in the master-planning process. This work is described in Chapter 11: *Landscape and visual effects* of this PEIR.

vii). ***Drainage, ground conditions and the water environment*** – the site's ground and water characteristics were established at an early stage to ensure that the master plan took into account drainage, flood risk and land contamination. The master plan reflects the need to ensure that drainage from rooftops and hard-surfaced areas in the proposed development does not cause enhanced flood risk and contamination off site, as explained in Chapters 14: *Hydrogeology*, 15 *Surface water and flood risk* and 16 *Geology, soils and contaminated land* of this PEIR.

4.114 The Applicant is ensuring that there is a close iterative feedback between the environmental analysis and master-planning process for the project. The Applicant has reviewed a series of development layouts, the evolution of which will now be summarised.

Master planning options

4.115 Figure 4.1 shows a preliminary version of the master plan for the Main HNRFI Site, produced in 2018. A strong influence on the general layout is the inherently rectilinear shape of B8 buildings and their curtilages. The layout in Figure 4.1 features the following main elements.

i). Railway sidings and a Railport for the unloading and loading of freight containers located immediately alongside the existing railway.

ii). Road access directly from M69 Junction 2, which would be upgraded with new slip roads on and off the motorway to the south of the junction.

iii). B8 buildings up to a maximum height of 23 metres above ground level and with a gross floorspace of 850,000 square metres including c. 225,000 square metres of mezzanine floorspace, giving a gross built footprint of c. 625,000 square metres, are arranged in rows between the railway and the motorway and with ancillary car and lorry parking and boundary landscape works and planting. Figure 4.1 includes two very large buildings and one smaller building adjacent to the Railport.

iv). A network of internal roads providing access to all areas of the site, in corridors with further landscape works and planting.

v). Structural landscape works and planting around most of the site boundary, incorporating balancing ponds and drainage swales. An area of land at the south-western extremity of the site, adjacent to Burbage Wood, is intended for public access for informal recreation.

vi). The draft Order Limits include land to allow for construction lay-down and access diversions.

4.116 Figure 4.2 shows the subsequent iteration of the master plan that was used for an informal first round of public consultation on the HNRFI Project in autumn 2018. The plan is similar to Figure 4.1 save for the redesign of the proposed open space amenity area and the adjacent building layout at the south-western corner of the Main HNRFI Site. In this option the footprint of buildings increased from c. 625,000 square metres to c. 640,000 square metres.

4.117 The evaluation of development layout options continued whilst the autumn 2018 public consultation was in progress. Figure 4.3 shows an option in which buildings are arranged end-on to the Railport in order to give more occupiers a direct frontage. This option has a built footprint of c. 625,000 square metres. The indicative landscape arrangement for the amenity area in the south-western part of the site is also amended, with the bund and tree screen placed alongside the closest building in order to achieve a better transition between the developed area to the north-east and the rural area to the south and west.

Options tested in response to the 2018 public consultation

4.118 In the light of the feedback received from the first round of informal public consultation in autumn 2018, the Applicant considered various revisions to the master plan for the HNRFI Project. The resulting illustrative master plan is shown in Figure 4.4. Comparison with the 2018 master plan in Figure 4.2 reveals how the master plan evolved in response to consultation feedback and continuing environmental impact assessment. The changes

can be summarised as follows.

4.119 ***Feedback:*** *concerns over the degree to which the development offers rail access and about the effects of noise from the railport on the amenity of residential properties beyond the railway, in Elmesthorpe and to the south-west of the village.*

4.120 ***Response:*** The Applicant considered the option of relocating the Railport to the centre of the HNRFI site, providing enhanced rail connectivity for HNRFI occupiers and increasing the distance between the Railport and residential properties beyond the railway to the north-west. It was considered that the logistics buildings on either side of a centrally-placed Railport might help to contain the noise from freight handling operations.

4.121 Further noise attenuation was proposed in the landscape buffer across the north-eastern edge of the site, adjacent to Elmesthorpe. This included a tall acoustic fence alongside the curved section of railway between the lineside sidings and the railport, designed to contain any 'wheel squeal' from freight trains moving between the two.

4.122 ***Feedback:*** *concern over the loss of recreational equestrian, cycle and walking routes that cross the Main HNRFI Site.*

4.123 ***Response:*** relocation of the Railport to the centre of the site facilitated the provision of a recreational route between Burbage Common to the south-west of the HNRFI and Burbage Common Road near Elmesthorpe to the north-east. This recreational route was set within the landscape buffer along the railside edge of the site, with underpasses providing safe access beneath the road at the Burbage Common Road railway bridge, and beneath the proposed railway line in the northern corner of the Main HNRFI Site.

4.124 A further recreational access route was proposed in the landscape corridor between a point north of Freeholt Wood to an existing footbridge over the M69 motorway, c. 700m north of M69 Junction 2.

4.125 ***Feedback:*** *the proposed recreational open space in the south-western corner of the site would effectively be cut off from Burbage Wood by the proposed landscape buffer around the HNRFI site.*

4.126 ***Response:*** the landscape buffer was realigned to follow the proposed edge of the built development, promoting a greater sense of connectivity between Burbage Wood and the proposed recreational open space. The amenity area, now referred to as the Burbage Common Expansion, was enlarged. In addition, a new community hall was proposed on a site to the east of the recreational open space.

4.127 ***Feedback:*** *concern that the HNRFI development, in conjunction with the proposed upgrade to M69 Junction 2, would attract unacceptable volumes of additional road traffic on the local road network, including the B4669 Sapcote Road / Hinckley Road on both sides of M69 Junction 2, which passes through Sapcote, and the B581 Broughton Road through Stoney Stanton, as well as on various routes further afield.*

4.128 ***Response:*** Informed by initial rounds of road traffic modelling explained in the transport chapter of this PEIR, the Applicant developed options for relief roads extending westward from the HNRFI site to the B4668 / A47 Leicester Road, by-passing Burbage and Hinckley, and eastwards towards the B4114 Coventry Road, by-passing Sapcote and Stoney Stanton. These options were the focus of a further round of informal public consultation in summer 2019 and are described in the following section of this PEIR chapter. The remainder of this section of Chapter 4 explains the further evolution of the master plan for the Main HNRFI Site that took place during 2020-21.

4.129 The immediate effect of the inclusion of these road links in the project was the redesign and realignment of the main internal access road across the southern part of the site. Whereas this main internal access road was designed in earlier iterations of the master plan as an internal service road only, the addition of the eastern and western road links would open the road to general traffic, necessitating a redesign. Figure 4.4 shows the status of the master plan in May 2019 and Figure 4.5 shows the master plan as it had evolved by November of that year. Both versions show a built footprint of c. 604,000sqm, a lower total accounted for principally by a reduction in the number and size of buildings proposed to the south of the access road across the southern part of the site.

The current draft master plan

4.130 Figure 3.1 of this PEIR shows the master plan as presented for the purpose of the current public consultation. The proposals are described in detail in Chapter 3 of this PEIR. In respect of how the master plan has evolved, noteworthy features include the following.

i). The Railport is returned to its original location alongside the Leicester to Hinckley railway, with a rail chord extending across the northern arc of the HNRFI site. This change has been made for the following reasons.

- Locating the Railport in the central area of the site was physically difficult to achieve due the gradient across the site. The layout was constraining in respect of the provision of road access to buildings between the Railport and the railway, and individual buildings could not be rail-served. Access roads would have to pass between buildings and railways, negating the benefits of railside locations.

- Access by rail to a centrally located Railport would require two parallel railway lines with a tight semi-circular radius at the northern end of the HNRFI. When rolling stock is hauled around a tight circle of track the differential rotation of the inner and outer wheels can cause sticking and sliding that results in 'wheel squeal' and a higher potential to derail wagons. The Applicant reviewed methods available to reduce or avoid wheel squeal. Common remedies include the use of rubber dampeners or wheel lubrication, as well as the erection of tall acoustic fences on the outside of the curve, before it was concluded that wheel squeal is simply best avoided if possible. A northern siding is retained in the latest master plan but with a better layout and a much-reduced length of curve

as part of a 'head shunt', which permits rail access into buildings.

- The consolidation of the main freight handling area in rail sidings parallel to the railway has the advantage of allowing trains to enter and leave the site in a single in or out movement, whether heading in the direction of Nuneaton or Leicester. In contrast, with the Railport located in the centre of the Site, trains arriving from or departing to the direction of Leicester would need to make a double movement (e.g. a forward movement southbound into a holding siding parallel to the main railway and then a reverse movement backwards into the Railport, and vice versa), an inherently inefficient arrangement.

ii). The latest development layout seeks to make the most efficient use of land inside the HNRFI. The indicative layout has an internal built footprint of 650,000 square metres with buildings permissible under the proposed DCO parameters to a maximum building height of 33 metres, as measured from ground level, an increase from the maximum heights envisaged previously. This height increase reflects evolving market expectations, informed by discussions with potential occupiers. Three buildings are shown indicatively on the Railport frontage, again in response to enquiries from potential occupiers.

iii). The A47 Link Road across the southern part of the Main HNRFI Site features three roundabouts to assist the safe integration of goods traffic with general east-west traffic using the proposed link road between M69 Junction 2 and the A47 Leicester Road.

iv). No B8 buildings are proposed to the south-west of the main access road. The area features a lorry park with welfare facilities and filling station, a site hub with offices and a marketing suite, an energy centre and a storage yard for empty freight containers, but is otherwise proposed as an amenity open space.

v). With the core of the Main HNRFI Site dedicated to B8 buildings, an amenity route between Elmesthorpe and Burbage Common is proposed along the eastern edge of the Main HNRFI Site, next to the M69 motorway. This would incorporate provision for pedestrians, cyclists and horse riders. As explained in Chapter 3: *Project description* of this PEIR, the amenity route would cross the A47 Link Road from M69 Junction 2 by means of a signalised 'Pegasus crossing' and would connect to the amenity open space along the south-western side of the HNRFI, from where access can be gained to Burbage Common via Smithy Lane and an existing underpass beneath the railway.

vi). Noise attenuation barriers have been introduced around much of the southern, western and northern edges of the Main HNRFI Site to contain operational noise.

vii). Consideration is being given to the attainment of biodiversity net gain (BNG) for the Proposed Development. As explained in PEIR Chapter 12: *Ecology and biodiversity*, TSH is reviewing options including financial contributions and/or the provision of an

area of land for off-site habitat creation and enhancement.

LINK ROADS AND OFF-SITE HIGHWAYS IMPROVEMENTS

Consultation feedback on road traffic

4.131 A substantial amount of feedback from the first informal consultation in autumn 2018 concerned the effects of the proposals on the local road network. The HNRFI proposal always envisaged that HGV traffic would be directed to the M69 motorway unless making local deliveries to avoid lorries passing through nearby settlements. However, the proposed upgrading of M69 Junction 2 to an all-ways junction will have a wider effect on the pattern of local traffic movements, creating attractive new routes for commuters and other traffic. Consultation feedback highlighted concern over the potential increase in road traffic on routes through local settlements, including Burbage and Hinckley to the west and Sapcote and Stoney Stanton to the east of M69 Junction 2.

4.132 In response and guided by further road traffic modelling, the Applicant undertook a further informal consultation in summer 2019 specifically on the issue of off-site highways effects. Views were invited on three road improvement options, shown in Map 4.10 and described below.

A link from the HNRFI site westwards to the A47

4.133 The A47 Link Road would provide a connection through the development site from M69 Junction 2 to the B4668 Leicester Road, before then connecting to the A47. It is envisaged that this option would comprise a 7.3m wide single carriageway road with a footpath and cycleway, with grass verges and new hedgerow and fences on its boundaries with farmland.

4.134 The purpose of the A47 Link Road would be to prevent traffic principally from Barwell and Earl Shilton to the north from travelling to and from the upgraded M69 Junction 2 via existing roads through Hinckley, Burbage, Elmesthorpe and Stoney Stanton.

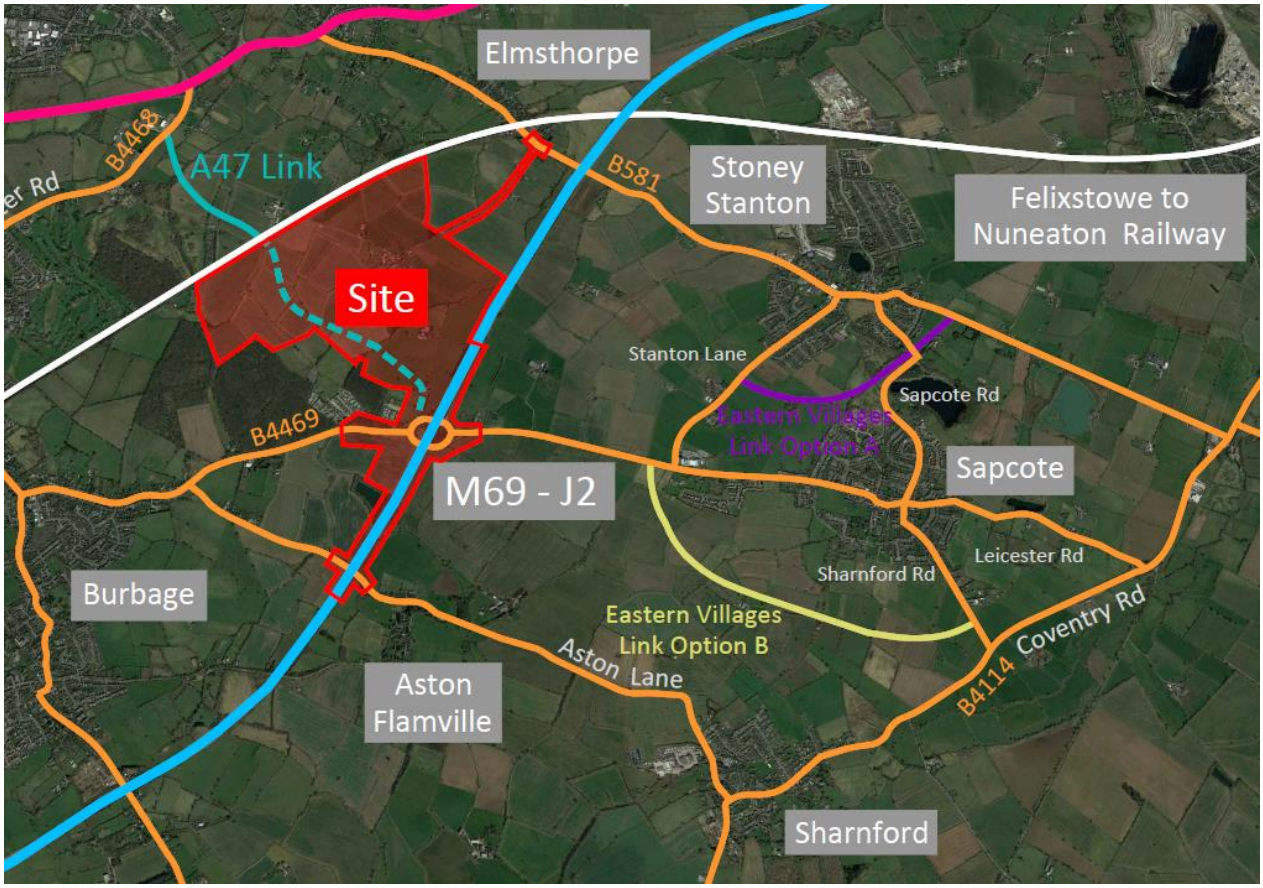
4.135 In effect the A47 Link Road would complete a 'Ring Road' around Hinckley (A5, A47, M69) reducing the need for traffic to route through the town centre and providing increased resilience along the A5, should there be any incidents of bridge strike by tall vehicles at Dodwell's roundabout on the southern side of Hinckley, for example.

Eastern villages option A: a by-pass around the southern side of Stoney Stanton

4.136 This would provide a connection between the B581 Broughton Road to the east of Stoney Stanton to Hinckley Road to the south of the village. Again, it was envisaged that this road would comprise a 7.3m wide single carriageway road with grass verges and new hedgerow and fences on its boundaries with farmland.

4.137 The purpose of this option would be to provide an alternative route for road traffic travelling east-west between the B4114 Coventry Road and the upgraded M69 Junction 2, by-passing the village centres of Stoney Stanton and Sapcote.

Map 4.10: Indicative location of the A47 and Eastern Villages link road options that were the subject of a public consultation in summer 2019. The general location of the Main HNRFI Site and M69 junction enhancement are indicated in red, but it should be noted that these are not the draft Order Limits as now proposed.



Background image: Google Earth

Eastern villages option B: a by-pass around the southern side of Sapcote

4.138 This option was intended to provide an alternative route for road traffic travelling east-west between the B4114 Coventry Road and the upgraded M69 Junction 2, by-passing the village centres of Stoney Stanton and Sapcote. It would provide a connection between the B4669 Hinckley Road west of Sapcote and Sharnford Road to the south-east of the village.

4.139 The envisaged design specification would be a 7.3m wide single carriageway road with grass verges and new hedgerow and fences on its boundaries with farmland.

Refined off-site highways options following the informal consultation

4.140 The Applicant has undertaken further traffic modelling to understand the impacts of the two bypass options in combination with the proposed A47 Link Road. The outputs from this traffic modelling indicated that the A47 Link Road would provide the most significant benefits in terms of removal of traffic from existing links when modelled alone and in tandem with the bypass options. Whilst the bypass option around Sapcote provided some relief through the village there were minimal benefits beyond this. Furthermore a number of vehicles were attracted to the route due to reduced travel time of the link, thus introducing more traffic into the area. The bypass around Stoney Stanton did not discernibly improve traffic conditions in the village itself.

4.141 The traffic modelling was revisited following further dialogue with the Local Highways Authority, LCC. A newer version of the Pan-Regional Transport Model (PRTM 2.1) was developed in 2020 (updated to version 2.2 in 2021), which refined the core model that had been used for traffic modelling hitherto. LCC requested that this be used to understand the effects of the proposed HNRFI development on the road network. The modelling included an access strategy for the HNRFI which incorporated the A47 Link Road and the proposed south facing slips at M69 Junction 2. The modelling scenarios included 'without HNRFI development but with access infrastructure' to better understand the background redistribution of traffic associated with the new slip roads and A47 Link Road independently of the development. The bypasses proposed previously were only to be considered once the redistribution was assessed.

4.142 Outputs from the PRTM 2.2 traffic modelling indicate that redistributed traffic makes up the majority of traffic flow change on the network when compared with traffic flows generated by the HNRFI. However, the new access infrastructure provides clear reductions of traffic on routes in and around Hinckley. Some increases are inevitable on routes around Stoney Stanton and Sapcote, but of these many have destinations or origins within the villages themselves. Further review indicates that the redistributed traffic constitutes a significant number of existing residents and businesses rather than through-traffic between the M69 and the B4114 Coventry Road to the east of the villages.

4.143 On this basis the Applicant has concluded that the level of through traffic doesn't justify the economic, social and environmental impacts of building a new bypass, and that the access infrastructure and off-site mitigation provided adequately mitigates the impacts of the HNRFI. The current proposals aim to reduce speeds and improve routes and junctions in Sapcote and Stoney Stanton, with public realm improvements including cycle and pedestrian connectivity proposed in Sapcote. These works are summarised in Table 3.2 of Chapter 3: *Project description* and assessed in Chapter 8: *Transport and traffic* of this PEIR.

Other off-site highway works

4.144 In addition to these major off-site highways works, traffic modelling has identified a need for modifications to several junctions on the local road network, in response to the different traffic flow pattern resulting partly from the proposed HNRFI development and principally from the M69 Junction 2 upgrade. These junction improvement options are

described and assessed in Chapter 3: *Project description* and Chapter 8: *Transport and traffic* of this PEIR.

4.145 PEIR Figure 4.6 shows all of the roads and junctions that were evaluated for potential works in connection with the Proposed Development with the assistance of the PRTM modelling described above. They are located across the districts Blaby and Hinckley and Bosworth and extend onto neighbouring local author areas. As PEIR Chapter 8: *Transport and traffic* and its appendices explain, in many cases the effects of HNRFI traffic and existing road traffic using revised routes once the proposed M69 Junction 2 enhancements and A47 Link Road are in place were either negligible or insufficient to justify further highway enhancements. Over 30 roads and junctions were scrutinised in more detail before the refined list of 11 enhancements identified in Table 3.2 and Figure 3.3 of Chapter 3: *Project description* of this PEIR were identified for the purpose of this public consultation.

4.146 The range of measures considered to improve traffic flows at off-site locations has included road widening, kerb realignment, the creation of additional lanes on the approach to junctions and the introduction of traffic lights, pedestrian crossings and a range of traffic calming methods to promote road safety and local amenity.

CONCLUSION

4.147 Throughout the Project the Applicant has reviewed a range of site, development, road and environmental mitigation options with a view to arriving at a proposal that fulfils the requirements of the NPS, respects neighbouring communities, responds to the local environmental context and fulfils the operational requirements of freight and logistics operators.

4.148 Prior to the submission of its DCO application, the Applicant will continue to review the emerging findings of the EIA for the HNRFI Project and feedback from stakeholder consultations.

Tritax Symmetry (Hinckley) Limited

HINCKLEY NATIONAL RAIL FREIGHT INTERCHANGE

Preliminary Environmental Information Report

Chapter 5: Need and policy

January 2022

This document forms a part of a Preliminary Environmental Information Report (PEIR) for the Hinckley National Rail Freight Interchange project.

A PEIR presents environmental information to assist consultees to form an informed view of the likely significant environmental effects of a proposed development and provide feedback.

This PEIR has been prepared by the project promoter, Tritax Symmetry (Hinckley) Limited. The Proposed Development is described in Chapter 3 of the PEIR and is the subject of a public consultation running from 12 January to 9 March 2022.

Details of how to respond to the public consultation are provided at the end of Chapter 1 of the PEIR and on the project website:

http://www.hinckleynrfi.co.uk/

This feedback will be taken into account by Tritax Symmetry (Hinckley) Limited in the preparation of its application for a Development Consent Order for the project.

Chapter 5 ◆ Need and policy

INTRODUCTION

5.1. The purpose of this chapter is to set out planning policy that is relevant to the determination of the merits of the HNRFI in the context of the national need for SRFI, and to the general principles of assessment.

5.2. As noted in chapter 1 of this PEIR, the application for the HNRFI will be determined under the provisions of the Planning Act 2008, which requires a DCO to be issued by the Secretary of State for Transport. The application will be made to PINS, rather than being submitted as a planning application directly to the relevant Local Planning Authorities (Blaby District Council and Hinckley and Bosworth Borough Council).

5.3. The Act defines the proposal for the HNRFI as a NSIP. The primary policy statement for the determination of this proposal is specifically provided by the NPS, which was approved by Parliament and published in December 2014.

5.4. The Government's planning policies for England are set out in the NPPF. The NPS (NPS paragraph 1.18) states that the NPPF is likely to be an important and a relevant consideration in decisions on nationally significant infrastructure projects, but only to the extent relevant to an individual project.

5.5. The provisions of development plans within Blaby District and Hinckley and Bosworth Borough may be relevant to the determination of the application for the HNRFI. However, the provisions of the development plan are not the starting point for the determination of an application for a DCO. Under Section 104 of the Planning Act 2008 the starting point for the determination of the application is the NPS rather than the Development Plan.

5.6. In this chapter the main provisions of the NPS are summarised. Subsequent chapters of this PEIR address specific environmental and technical considerations for the Proposed Development and identify additional policy relevant to individual environmental topics, from NPPF and development plans.

NEED AND POLICY

National Policy Statement for National Networks - December 2014

5.7. The NPS sets out the need for, and the Government's policies to deliver, the development of NSIPs on the national road and rail networks in England. An applicant seeking a DCO for a project that satisfies the statutory thresholds for a NSIP in the Planning Act 2008 does not have to substantiate a 'need case' for the proposal. The need is established by the

NPS. The need for the development of strategic rail freight interchanges in the national interest is specifically set out in the NPS – and referred to below.

5.8. In the determination of an application for a DCO the Secretary of State for Transport applies the NPS as the primary basis for decision-taking, unless one of the following exceptions apply, namely:

- *lead to the UK being in breach of its international obligations;*
- *be unlawful;*
- *lead to the Secretary of State being in breach of any duty imposed by or under the legislation;*
- *result in adverse impacts of the development outweighing its benefits;*
- *be contrary to legislation about how decisions are to be taken* (NPS paragraph 1.2).

5.9. In issuing the NPS the Government is satisfied that the policy *'strikes the best balance between the Government's economic environment and social objectives'* (NPS paragraph 1.11). Necessarily, as national policy guidance, the NPS sets *'high level policy rather than specifying locations for enhanced or new infrastructure'* (NPS paragraph 1.14).

5.10. The overall strategic aims of the NPPF and the NPS are consistent. The NPPF makes clear that *'the Framework does not contain specific policies for nationally significant infrastructure projects*' (NPPF paragraph 5). The NPS assumes the function of providing specific policy guidance and to *'provide transport policy which will guide individual development brought under it'* (NPS paragraph 1.19). The NPS provides guidance on other land use planning matters and imposes particular requirements including the consideration of environmental impacts. The fundamental objective is to achieve sustainable development (NPS paragraph 1.20).

The drivers of need for development of the national networks

5.11. The underlying intent of Government policy is to deliver national networks that meet the country's long-term need, supporting a prosperous and competitive economy and improving overall quality of life as part of a wider transport system. To achieve these objectives, the features to be secured from new national networks are set out at NPS paragraphs 2.1 – 2.9 and include:

- *Well-connected and high-performing networks with sufficient capacity which are vital to meet the country's long-term needs and support a prosperous economy. (NPS paragraph 2.1)*
- *Critical need to improve the national networks to address road congestion to provide safe, expeditious and resilient networks that better support social and economic activity, and to provide a transport network that is capable of stimulating and supporting economic growth. (NPS paragraph 2.2)*
- *A need for the development on the national networks to support national and local economic growth and regeneration, particularly in the most disadvantageous areas – helping to rebalance the economy. (NPS paragraph 2.6)*

- *A need to improve the integration between the transport modes, including the linkages to ports and airports. (NPS paragraph 2.8).*

5.12. The Government concludes:

'that at a strategic level ***there is a compelling need for development of the national networks*** *… The Examining Authority and the Secretary of State should therefore start their assessment of applications for infrastructure covered by this NPS on that basis'* (NPS paragraph 2.10) (emphasis added).

5.13. Subject to the detailed policies and protections in the NPS (and the legal constraints of the Act referred to above) *'there is a presumption in favour of granting development consent for national networks NSIPs that fall within the need for infrastructure established in this NPS'* (NPS paragraph 4.2).

The national need for Strategic Rail Freight Interchanges

5.14. The NPS remains an up-to-date statement of national planning policy for national networks. The NPS states:

'Over recent years rail freight has started to play an increasingly significant role in logistics and has become an important driver of economic growth'(paragraph 2.42).

5.15. The NPS acknowledges that rail is used to best effect to undertake the *'long haul primary trunk journey with other modes (usually road) providing the secondary (final delivery) leg of the journey'* (NPS paragraph 2.43).

5.16. The NPS states:

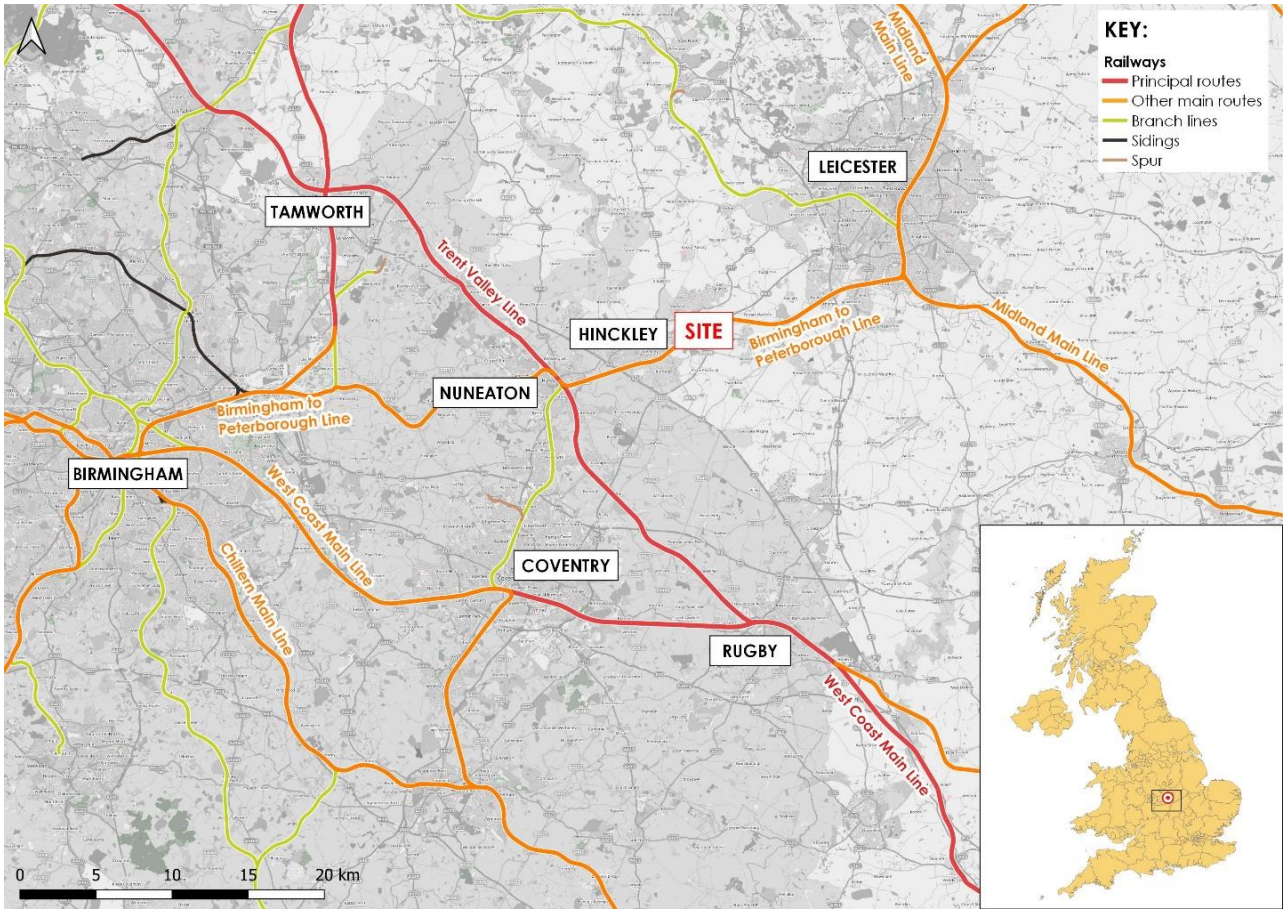
'The aim of a strategic rail freight interchange (SRFI) is to optimise the use of rail in the freight journey by maximising rail trunk haul and minimising some elements of the secondary distribution leg by road, through co-location of other distribution and freight activities. SRFIs are a key element in reducing the cost to users of moving freight by rail and are important in facilitating the transfer of freight from road to rail, thereby reducing trip mileage of freight movements on both the national and local road networks (paragraph 2.44)*'.*

5.17. Optimising the use of rail requires the *'logistics industry to develop new facilities that need to be located alongside the major rail routes close to major trunk roads, as well as located near to the conurbations that consume the goods'* (NPS paragraph 2.45).

5.18. The figures below show the location of the HNRFI in the context of:

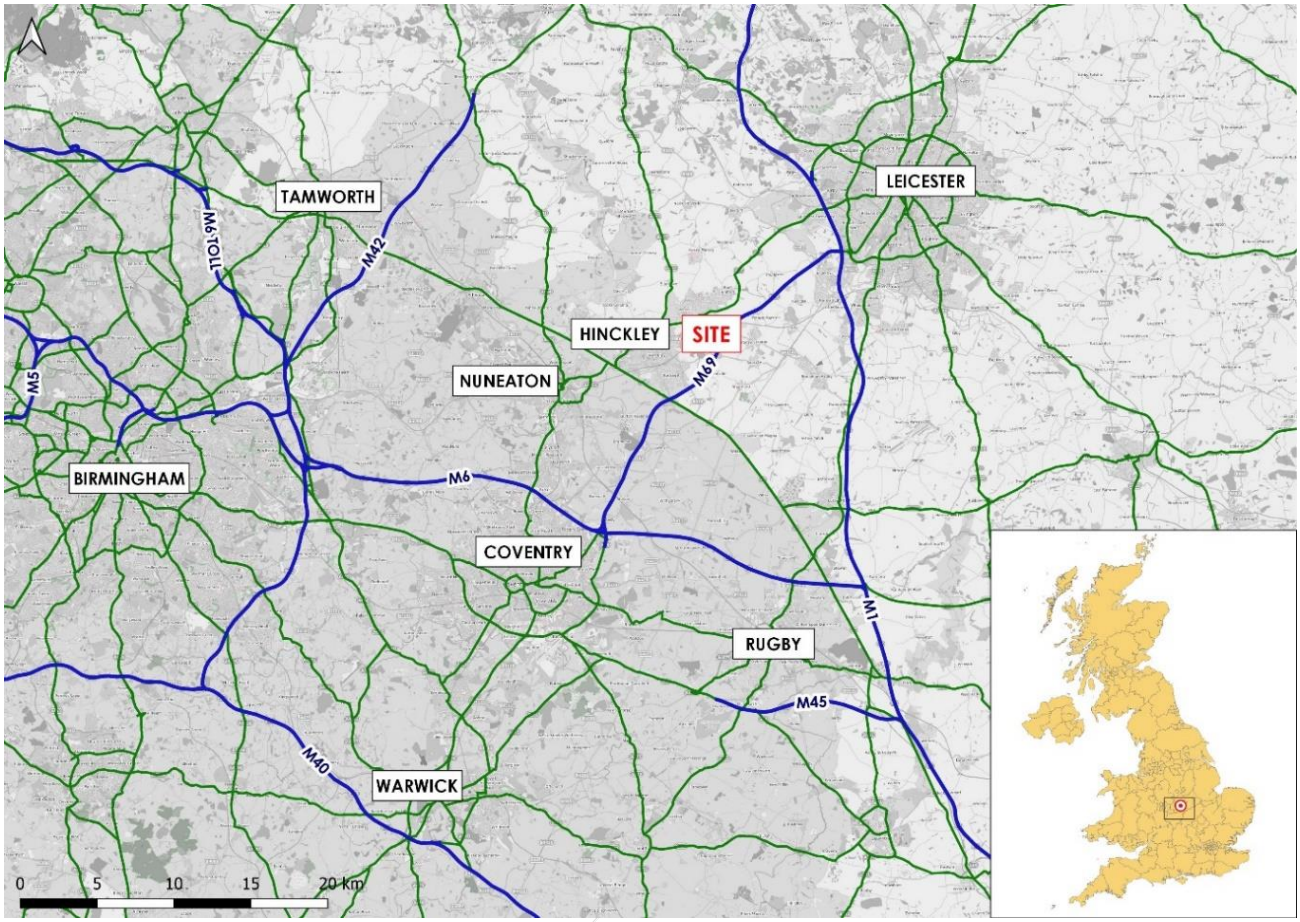
- the strategic rail freight network (Figure 5.1.1);
- the strategic road network (Figure 5.1.2);
- its location within a 30-mile radius of some 3 million people (Figure 5.1.3).

Figure 5.1.1 – the strategic rail freight network



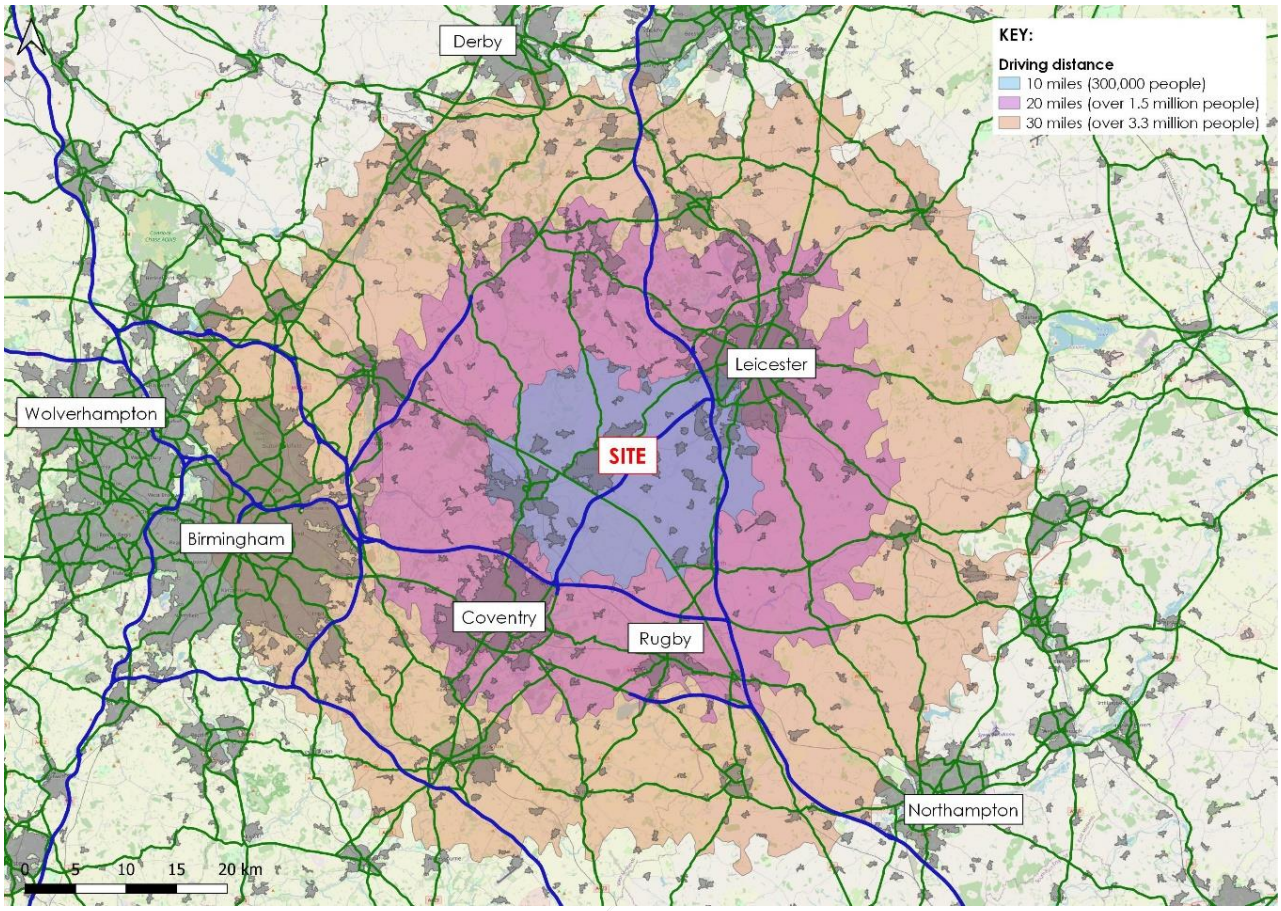
Source: BWB Consulting

Figure 5.1.2 – the strategic road network



Source: BWB Consulting

Figure 5.1.3 – the location of HNRFI within a 30-mile radius of some 3 million people



Source: BWB Consulting

5.19. The Baker Rose Consulting report highlights the rapid evolution of the logistics sector, including the rapid and significant growth in the purchasing of goods 'on-line' arising from the Covid 19 pandemic and the requirement for increased global resilience in supply chains for manufacturers. The NPS acknowledges the dynamics of the logistics sector, stating:

'the nature of that commercial development is such that some degree of flexibility is needed when schemes are being developed, in order to allow the development to respond to market requirements as they arise'(NPS paragraph 2.45).

5.20. The desired ability to respond to market requirements within the large-scale logistics sector is reflected in the proposed use of development parameters, assessed in accordance with 'Rochdale envelope' principles, as explained in Chapter 1 of this PEIR. This defines the maximum size and scope of the development while allowing some flexibility in the form and scale of built development.

The drivers of need for SRFIs

5.21. The drivers of need for SRFIs are set out at NPS paragraphs 2.46 – 2.52 under the headings:

- *The changing needs of the logistics sector (NPS paragraph 2.47);*
- *Rail Freight Growth (NPS paragraph 2.48 – 2.50);*
- *Environmental (NPS paragraph 2.51);*
- *UK economy, national and local benefits – jobs and growth (NPS paragraph 2.52).*

5.22. The Government's policy for addressing the need for SRFIs is set out at NPS paragraphs 2.53 – 2.58 and may be summarised as follows:

- *the Government's vision for transport is for a low carbon sustainable transport system that is an engine for growth, but is also safe and the quality of life in our communities (NPS paragraph 2.53).*
- *it is important to facilitate the development of intermodal rail freight industry (NPS paragraph 2.53).*
- *the transfer of freight from road to rail has an important part to play in a low carbon economy, and in addressing climate change (NPS paragraph 2.53).*
- *a network of SRFIs is needed across the regions to serve regional, sub-regional and cross-regional markets (NPS paragraph 2.54).*
- *in all cases it is essential that SRFIs have good connectivity with both the road and rail networks*, in particular the strategic rail freight network (NPS paragraph 2.54).

5.23. It is important that SRFIs are located near the business markets they will serve – and linked to key supply chain routes (NPS paragraph 2.56). SRFI capacity needs to be provided at a wide range of locations to provide flexibility needed to match the changing demands of the market – possibly with traffic moving from existing RFI to new larger facilities.

5.24. The Planning Statement that will accompany the Applicant's DCO application for the HNRFI will address the policy considerations set out in the NPS, and other planning policy that is relevant in the context of the specific proposal for the HNRFI, and draw upon supporting documentation and assessments, including the analysis undertaken by Baker Rose Consulting.

General principles of assessment

5.25. The NPS states at paragraph 4.3:

'In considering any proposed development, and in particular, when weighing its adverse impacts against its benefits, the Examining Authority and the Secretary of State should take into account:

- *its potential benefits, including the facilitation of economic development, including job creation, housing and environmental improvement, and any long-term or wider benefits;*

- *its potential adverse impacts, including any longer-term and cumulative adverse impacts, as well as any measures to avoid, reduce or compensate for any adverse impacts.'*

5.26. The environmental, safety and economic benefits and adverse impacts are to be considered at national, regional and local levels.

5.27. Applications for road and rail projects (other than SRFIs) are prepared in accordance with the Treasury 'Green Book' principles (guidance issued by the Treasury on how to appraise policies, programmes and projects) so as to provide the basis for investment decisions. In the case of SRFIs *a 'judgement of viability is to be made within the market framework'*. (NPS paragraph 4.8)

Good design for national networks

5.28. The Government acknowledges that, given the nature of an SRFI, there might be a limit on the extent to which it can contribute to the enhancement of the quality of the area (NPS paragraph 4.30). Nevertheless, the Government considers that *'there may be opportunities for the applicant to demonstrate good design in terms of siting and design measures relative to existing landscape and historical character and function, landscape permeability, land form and vegetation'* (NPS paragraph 4.34).

5.29. The Design and Access Statement that accompanies this PEIR describes how the design process has been conducted and how the design for the HNRFI has evolved. Visual appearance is a key factor in considering the design of new infrastructure as well as functionality, being fit for purpose, sustainability and cost (NPS paragraph 4.29). The planning objective for good design is to produce:

'…sustainable infrastructure sensitive to place, efficient in the use of natural resources and energy used in their construction, matched by an appearance that demonstrates good aesthetics as far as possible' (NPS paragraph 4.29).

5.30. The achievement of good design does not mean all adverse impacts are to be avoided, but rather should be minimised. The NPS states:

'A good design will also be one that sustains the improvements to operational efficiency for as many years as is practicable, taking into account capital cost, economics and environmental impacts . . .

'The Secretary of State needs to be satisfied that national networks infrastructure projects are sustainable and as aesthetically sensitive, durable, adaptable and resilient as they can reasonably be'. (NPS paragraphs 4.31, 4.32 in part)

Climate change adaptation

5.31. In designating the National Networks NPS, the Secretary of State had a statutory obligation to have regard to the desirability of mitigating and adapting to climate change (Planning Act 2008 S10(3)(a)) (NPS paragraph 4.36).

5.32. Chapter 18: *Energy and climate change* of this PEIR explains now the impacts of climate change have been taken into account when planning location, design, build and operation of the HNRFI.

5.33. In the preparation of the proposals for the HNRFI consultation has been undertaken with relevant authorities whose duties are to prevent pollution and regulate other environmental regimes, including land drainage and addressing flood risk. The relevant sections of this PEIR consider possible sources of nuisance (s.90 Environmental Protection Act) and how such nuisance may be mitigated or limited, including considerations relating to noise emissions, air quality and artificial light.

Safety

5.34. The NPS requires consideration of safety on the railways to be taken into account and for a safety assessment to have considered the safety implications during the construction, commissioning and operational phases of the development (NPS paragraph 4.71).

5.35. The operation of the HNRFI has an impact upon existing railway crossing points. Network Rail has undertaken a detailed assessment of the HNRFI scheme and has been closely involved in its design development and in an assessment of impacts, including requirements for protecting the safety of the railway during construction, commissioning and operation of the railway. The outcomes have gone through Network Rail's internal governance procedures for Asset Protection and Optimisation (ASPRO).

5.36. There is a direct impact on three existing level crossings used by the public, which will be closed; and an indirect impact on two further level crossings where the footpath will be diverted to cross the railway via a footbridge, for safety reasons.

5.37. The NPS states:

'The Secretary of State should not grant development consent unless satisfied that all reasonable steps have been taken, and will be taken to:

- *minimise the risk of deaths or injury arising from the scheme; and*
- *contribute to an overall improvement in societal safety levels;*

- *noting that railway developments can influence risk levels both on and off the railway networks.'* (NPS paragraph 4.72)

Health

5.38. The Government acknowledges that SRFIs have the potential to affect the health, well-being and quality of life of the population. In the absence of appropriate design and mitigation, SRFIs might have direct impacts on health because of traffic noise, vibration, air quality emissions, light pollution, community, severance, dust, odour, polluting water, hazardous waste and pests (NPS para. 4.79).

5.39. SRFIs might also have indirect health impacts, for example if the development affects access to key public services, local transport opportunities for cycling and walking or the use of open space for recreation and physical activity.

5.40. The direct and indirect health impacts of the HNRFI are addressed in individual chapters of this PEIR. A PROW Strategy has been prepared as a consequence of the proposed closure of Burbage Common Road which is used as a recreational route by walkers, cyclists and horse riders. The Strategy addresses the means by which connectivity of PROWs is addressed within the proposals.

Specific policy provisions for strategic rail freight interchanges

5.41. The NPS sets out the policy requirements for SRFIs at paragraphs 4.83–4.89, which are summarised below under the following sub-headings:

- **Rail freight interchange function**
  From the outset a SRFI should be developed in a form that can accommodate both rail and non-rail activities (NPS paragraph 4.83).

- **Transport links and location requirements**
  - SRFIs need to be appropriately located relative to the markets they will serve.
  - Have good road access as this will allow rail to effectively compete with and work alongside road freight to achieve a modal shift to rail.
  - Hence countryside locations may be required (NPS paragraph 4.84).
  - Adequate links to the rail and road networks are essential (NPS paragraph 4.85).
  - As a minimum, SRFI should be located on a railway with a gauge capability of W8 or more (NPS paragraph 4.85).
  - By necessity, SRFIs will involve *'large structures, buildings and the operation of heavy machinery'*. These large-scale operations will have continuous working arrangements (NPS paragraph 4.86).

5.42. The F2N strategic freight route has been 'cleared' (in physical engineering) by Network Rail to W10 gauge, meaning the railway line can carry shipping containers 2.9m in height and 2.5m wide.

5.43. It is recognised in the NPS that SRFIs can provide many benefits for the local economy, including a range of new employment opportunities (NPS paragraph 4.87).

5.44. Chapter 7: *Land use and socio-economic effects* of the PEIR identifies the potential opportunities the development will provide, and the existence of an *'available and economic local workforce'* (NPS paragraph 4.87).

Scale and design

5.45. The NPS states at paragraph 4.88:

'Applications for a proposed SRFI should provide for a number of rail connected or rail accessible buildings for initial take up, plus rail infrastructure to allow more extensive rail connection within the site in the longer term. The initial stages of the development must provide an operational rail network connection and areas for intermodal handling and container storage. It is not essential for all buildings on the site to be rail connected from the outset, but a significant element should be'.

5.46. The NPS does not contain a glossary as to the meaning of the terms 'rail connected' and 'rail accessible'. In the Examining Authority's *Report of Findings and Conclusions and Recommendations to the Secretary of State for Transport on the West Midlands Rail Freight Interchange* (Planning Inspectorate ref. TR050005), the Examining Authority adopted the following approach:

- **Rail-connected** – a warehouse or other building either with its own dedicated rail siding or which is sufficiently close to the rail terminal to allow containers to be moved from the rail wagons into the warehouse by overhead cranes or reach stackers without the need for them to be loaded onto a HGV or Tugmaster vehicle.

- **Rail-served** – a warehouse forming part of the Strategic Rail Freight Interchange development, but which would require containers to be moved from or to the rail terminal by means of a HGV or Tugmaster vehicle.

- **Rail-accessible** – having the potential either for a direct rail connection (rail-connected) or to be rail-served.

5.47. Section 5 of the NPS identifies a range of generic impacts that may arise from the provision of national networks infrastructure. These impacts are identified in the NPS and briefly described below. These considerations are addressed in subsequent chapters of the PEIR, and will be addressed in the ES.

Air quality

5.48. The NPS states (NPS paragraph 5.7) that the environmental statement should describe:

- existing air quality levels;

- forecasts of air quality at the time of opening, assuming that the scheme is not built (the future baseline) and taking account of the impact of the scheme; and
- any significant air quality effects, their mitigation and any residual effects, distinguishing between the construction and operation stages and taking account of the impact of road traffic generated by the project.

5.49. In addition to the information on the likely significant effects of a project in relation to EIA, the Secretary of State must be provided with a judgement on the risk as to whether the HNRFI would affect the UK's ability to comply with the Air Quality Directive (2008/50/EU).

5.50. This environmental impact is considered in Chapter 9: *Air quality* of the PEIR and will be addressed in the ES that accompanies the application for a DCO.

Carbon emissions

5.51. The NPS refers to the Government's legally binding framework to cut greenhouse gas emissions by at least 80% by 2050. On 20 April 2021 the Government published the sixth Carbon Budget and announced a revised climate change target of cutting carbon emissions by 78% by 2035 compared to 1990 levels. Chapters 9: *Air quality* and 18: *Energy and climate change* of this PEIR describe the likely significant climate factors arising from this development.

5.52. The ES will describe an assessment of any likely significant climate factors in accordance with the requirements of the EIA Regulations (NPS paragraph 5.17). Chapter 18: *Energy and climate change* of this PEIR provides an interim assessment.

Biodiversity and ecological conservation

5.53. The NPS states (NPS paragraph 5.22) that the applicant should ensure the environmental statement clearly sets out any likely significant effects:

'Where the project is subject to EIA the applicant should ensure that the environmental statement clearly sets out any likely significant effects on internationally, nationally and locally designated sites of ecological or geological conservation importance (including those outside England) on protected species and on habitats and other species identified as being of principal importance for the conservation of biodiversity and that the statement considers the full range of potential impacts on ecosystems.'

5.54. The applicant should also show how the project has taken advantage of opportunities to conserve and enhance biodiversity, and geological conservation interests (NPS paragraph 5.23).

5.55. Chapter 12: *Ecology and biodiversity* of this PEIR sets out any likely significant effects of the development on biodiversity interests, and the strategy to achieve a net biodiversity gain.

Waste management

5.56. The NPS states that the applicant should set out the arrangements that are proposed for managing any waste produced during the construction and operational phases of the development. The objective in the assessment is to minimise the volume of waste produced and the volume of waste sent for disposal unless it can be demonstrated that the alternative is the best overall environmental outcome (NPS paragraph 5.42).

5.57. The NPS (NPS paragraph ??) refers to sustainable waste management being implemented through the 'waste hierarchy' which comprise:

- prevention
- preparing for re-use
- recycling
- other recovery including energy recovery, and
- disposal

5.55 Chapter 17: *Materials and waste* of this PEIR addresses this environmental consideration.

Dust, odour, artificial light, smoke and steam

5.56. The NPS (NPS paragraph ??) states that the applicant should assess any likely significant effects on amenity from the emissions of odour, dust, steam, smoke and artificial light (paragraph 5.84). In particular the assessment should describe:

- the type and quantity of emissions;
- aspects of the development which may give rise to emissions during construction, operation and decommissioning;
- premises or locations that may be affected by the emissions;
- effects of the emission on identified premises or locations; and
- measures to be employed in preventing or mitigating the emissions.

5.57. The construction and operation of national networks infrastructure such as the HNRFI has the potential to create emissions (identified above) in the form of dust and artificial light. These potential environmental effects are considered at Chapters 9: *Air quality* and 11: *Landscape and visual effects* of this PEIR.

Flood risk

5.58. The NPS requires an applicant, in preparing a FRA, to:

- consider the risk of all forms of flooding arising from the project (including in adjacent parts of the United Kingdom), in addition to the risk of flooding to the project, and demonstrate how these risks will be managed and, where relevant, mitigated, so that the development remains safe throughout its lifetime;
- take the impacts of climate change into account, clearly stating the development lifetime over which the assessment has been made;

- consider the vulnerability of those using the infrastructure including arrangements for safe access and exit;
- include the assessment of the remaining (known as 'residual') risk after risk reduction measures have been taken into account and demonstrate that this is acceptable for the particular project;
- consider if there is a need to remain operational during a worst case flood event over the development's lifetime;
- provide the evidence for the Secretary of State to apply the Sequential Test and Exception Test, as appropriate.

5.59. The NPS states that the applicant (and the Examining Authority and the Secretary of State in taking decisions) should take account of the policy on climate change adaptation. This consideration includes resilience to flooding and avoidance to increased flood risk beyond the site. The considerations are addressed in Chapter 14: *Surface water and flood risk* of this PEIR.

5.60. The DCO application submission will be accompanied by a Flood Risk Assessment (FRA) which will identify and assess the risks of all forms of flooding to and from the HNRFI. The FRA will demonstrate how these flood risks will be managed taking climate change into account (NPS paragraph 5.93).

The historic environment

5.61. The NPS states that the applicant should undertake an assessment of any likely significant heritage impacts of the proposed project as part of the ES. The assessment should describe the significance of any heritage assets affected, including the contribution made to their setting. The level of detail provided in the PEIR should be proportionate to the asset's importance and is no more than is sufficient to understand the potential impact of the proposal upon their significance. As a minimum the relevant Historic Environmental Record is referred to. Where a site on which development is proposed includes, or has the potential to include, heritage assets with archaeological interest, the applicant should include an appropriate desk based assessment and, where necessary, a field evaluation (NPS paragraph 5.126-5.127).

5.62. The form and scale of the HNRFI is such that it would have the potential to cause adverse effects on the historic environment in the absence of appropriate design and mitigation. There are no designated heritage assets inside the draft DCO Order Limits. Chapter 13: *Cultural heritage* of the PEIR has considered this issue, identifying both designated and non-designated heritage assets within [5km] of the Main HNRFI Site. The development gives rise to the application of the statutory duty under Section 66(1) and Section 72(1) of the Listed Buildings Act 1990.

5.63. The assessment undertaken in Chapter 13 has considered the impact of the HNRFI upon the significance of designated heritage assets, including scheduled monuments, listed buildings and conservation areas. The assessment includes consideration of the impact of the HNRFI on the three farmsteads proposed for demolition which comprises non-

designated heritage assets. The effect of the HNRFI during the construction stage are considered at the operation phase in order to capture the worst case scenario.

Landscape and visual effects

5.64. The NPS acknowledges that landscape and visual effects of a NSIP will vary on a case by case basis according to the type of development, its location, and the landscape setting of the proposed development (NPS paragraph 5.143). The NPS requires an assessment of any likely significant landscape and visual impacts to be undertaken. The assessments should include reference to any landscape character assessment as a means of assessing landscape impacts relevant to the proposed project. The assessment should take account of relevant policies in local development documents (NPS paragraph 5.144).

5.65. The required assessment should include:

- any significant effects during construction of the project, and / or the significant effects of the completed development and its operation on the landscape components and landscape character (NPS paragraph 5.145); and
- the visibility and conspicuousness of the project during construction and of the presence and operation of the project and potential impact on views and visual amenity; (NPS paragraph 5.146)
- consideration of visual amenity should include any noise and light pollution effects, including on local amenity, tranquillity and nature conservation (NPS paragraph 5.146).

5.66. The Applicant has undertaken these assessments of the impact of HNRFI which are described at Chapter 11: *Landscape and visual effects* of this PEIR. The assessments have been undertaken following the approach set out in Guidelines for Landscape and Visual Impact Assessment 3rd Edition, published by the Landscape Institute.

5.67. The Landscape and Visual Assessment references any landscape character assessment and associated studies as a means of assessing landscape impacts relevant to the HNRFI. The assessment also takes into account relevant policies based on these assessments in local development plan documents (NPS paragraph 5.144).

5.68. The assessment includes any significant effects during construction of the HNRFI and the significant effects on the completed built form, and its operation on landscape components and landscape character (NPS paragraph 5.145).

5.69. The assessment includes the visibility and conspicuousness of the HNRFI during construction and of the presence and operation of the HNRFI and potential impacts on views and visual amenity. These assessments include any noise and light pollution effects, including on light amenity, tranquillity and nature conservation. The assessment considers the impact upon amenity to visitors to Burbage Common and users of the surrounding network of PROW.

5.70. The scale and form of the HNRFI will inevitably have effects on the host location and over a wider setting. Landscape works and planting can mitigate, to some extent, the effects upon landscape character and visual impact from beyond the site boundary, but will not obscure built development of this scale. These considerations are addressed at Chapter 11: *Landscape and visual effects* of the PEIR. Structural landscaping is proposed on the boundaries of the Main HNRFI Site, with additional landscaping on individual plots.

Land use including open space, green infrastructure and Green Belt

5.71. HNRFI does not involve land within the Green Belt. The Main Site comprises greenfield land.

5.72. The NPS states that the applicant's assessments should identify existing and proposed land uses near the project; any effects of replacing an existing development or use of the site with the proposed project or preventing a development or use on a neighbouring site from continuing. Applicants should also assess any effects of precluding a new development or use proposed in the development plan. The NPS acknowledges that these assessments should be proportionate (NPS paragraph 5.165).

5.73. As stated above, in the context of the assessment of landscape and visual impacts, an assessment has been undertaken of the impacts of the development on nearby land uses, including Burbage Common; residential developments including gypsy and traveller communities; and commercial operations comprising equestrian businesses. An assessment is also made whether the HNRFI would give rise to any effects that might preclude new development or a use proposed in a development plan from proceeding.

5.74. In undertaking pre-application discussions with Hinckley and Bosworth Borough Council, officers have particularly identified concerns as to the potential impact of the HNRFI on the amenity of visitors to Burbage Common. An assessment of impact on visitors has been undertaken within Chapter 11: *Landscape and visual effects* of the PEIR. The assessment in the context of land use includes consideration of the agricultural land quality of the site, and recognises the economic and other benefits of best and most versatile agricultural land.

5.75. The proposed HNRFI is located close to Burbage Common and Woods, which are situated to the south-west of the main development site. Burbage Common and Woods provides recreational amenity to walkers and horse riders. A visitor centre includes provision for refreshments to visitors. Chapters 7: *Land use and socio-economic effects* and 11: *Landscape and visual effects* of this PEIR addresses impact upon land use, landscape and visual amenity, including the effects of the development upon the recreational value of Burbage Common. The assessment includes consideration of the relevant development plan policy (Hinckley and Bosworth Core Strategy Policy 20 Green Infrastructure).

Noise and vibration

5.76. The NPS states that the applicant should include the following matters in the noise assessment, namely (NPS paragraph 5.189):

- *'a description of the noise sources including likely usage in terms of number of movements, fleet mix and diurnal pattern. For any associated fixed structures, such as ventilation fans for tunnels, information about the noise sources including the identification of any distinctive tonal, impulsive or low frequency characteristics of the noise.*
- *identification of noise sensitive premises and noise sensitive areas that may be affected.*
- *the characteristics of the existing noise environment.*
- *a prediction on how the noise environment will change with the proposed development:*

  – *In the shorter term such as during the construction period;*
  – *in the longer term during the operating life of the infrastructure; oat particular times of the day, evening and night as appropriate.*

- *an assessment of the effect of predicted changes in the noise environment on any noise sensitive premises and noise sensitive areas.*
- *measures to be employed in mitigating the effects of noise. Applicants should consider using best available techniques to reduce noise impacts.*
- *the nature and extent of the noise assessment should be proportionate to the likely noise impact.'*

5.77. The potential noise impact elsewhere that is directly associated with the proposed development, for example changes in road and rail traffic movements elsewhere on the national networks is to be considered as appropriate (NPS paragraph 5.190). The assessment of noise arising from the construction, and operational stages of the HNRFI is assessed at Chapter 10: *Noise and vibration* of this PEIR.

5.78. Operational noise with respect to human receptors has been assessed using the principles of the relevant British Standards. The relevant British Standards are referred to in the assessment for prediction and assessment of construction noise which is addressed in Chapter 10: *Noise and vibration* of this PEIR.

5.79. Noise and vibration from national networks can affect the quality of human life and health. Such emissions can also affect wildlife and biodiversity. The consultants addressing the impact of the HNRFI on ecological interests have confirmed that noise from the construction phase and operational phase (Chapter 10 Table 10.2) does not need to be considered at ecological receptors. The assessment in Chapter 12: *Ecology and biodiversity* concludes that neither the construction phase nor the operational phase of the HNRFI will adversely impact on ecological interests by reasoning of noise emissions.

Impacts on transport networks

5.80. The NPS states (NPS paragraph 5.203) that applicants should have regard to policies set out in local plans relating to the impact of development on transport networks. Consultation with relevant highway authorities is urged. In developing new national

networks, applicants should consider reasonable opportunities to support other transport modes (NPS paragraph 5.205).

5.81. The preparation of the Transport Assessment has had regard to transport policies in the local plans for Hinckley and Bosworth Borough and Blaby District. The Transport Assessment uses the WebTag methodology stipulated in the Department of Transport Guidance. The impact of the HNRFI on the wider highway network has been modelled using the County Council' Pan-Regional Transport Model (PRTM). Chapter 8: *Transport and traffic* describes the environmental impacts arising on transport networks, and the proposed off-site mitigation works and opportunities to travel by other transport modes. Consultation has been undertaken with Leicestershire County Highway Authority and National Highways (formerly Highways England) and Warwickshire County Highway Authority. Due consideration has been given to the support for other transport modes to provide accessibility by a genuine choice of transportation.

5.82. The Applicant has prepared a draft Travel Plan which includes measures to mitigate transport impacts. Measures are proposed to improve access by public transport and sustainable modes of travel.

5.83. The NPS states in the specific context of SRFI:

'Provided that the applicant is willing to commit to transport planning obligations and, to mitigate transport impacts identified in the WebTAG transport assessment (including environment and social impacts, with attribution of costs calculated in accordance with the Department's guidance, then development consent should not be withheld. Appropriately limited weight should be applied to residual effects on the surrounding transport infrastructure.' (NPS paragraph XX)

5.84. These considerations relate to the effects of an NSIP on the operation of the wider transport network during the construction and operational periods of the development. A particular consideration in the current context is the installation of additional slip roads at M69 Junction 2 so that it can function as an 'all-ways' junction. The provision of the additional slip roads will result in traffic reassignment on the highway network that is unrelated to the development traffic generated by the HNRFI itself.

5.85. The development will have effects on existing PROW, and will require the closure of Burbage Common Road to vehicles, pedestrians, cyclists and equestrians. The proposals for maintaining links through the site, other than by motorised vehicles area addressed at Chapter 8: *Transport and traffic* of the PEIR.

5.86. The impact of the development related traffic, the provision of the A47 Link Road and the effects of upgrading M69 Junction 2 to all-ways movement are addressed also in Chapter 8: *Transport and traffic* of the PEIR. The effects of the scheme on the highway network have been modelled extensively. A Transport Assessment is being prepared to accompany the DCO application.

5.87. Chapter 8: *Transport and traffic* of this PEIR also considers the effects of the Proposed Development in transferring goods from road to rail across the wider transport network.

Water quality and resources

5.88. The NPS states (NPS paragraph 5.223) that the environmental statement should describe:

- the existing quality of waters affected by the proposed project;
- existing water resources affected by the proposed project and the impacts of the proposed project on water resources;
- existing physical characteristics of the water environment (including quantity and dynamics of flow) affected by the proposed project, and any impact of physical modifications to these characteristics;
- any impacts of the proposed project on water bodies or protected areas under the Water Framework Directive and source protection zones (SPZs) around potable groundwater abstractions; and
- any cumulative effects.

5.89. Chapter 14: *Hydrogeology* of the PEIR addresses these environmental considerations.

5.90. Infrastructure development can have adverse effects on the ground water environment unless suitably mitigated. During construction and operation, the development can lead to an increased demand for water. The provision of impermeable surfaces for the Railport and the provision of buildings, service yards and parking areas will each involve the discharge of surface water from rainfall. There might also be an increased risk of spills and leaks of pollutants to the water environment. These considerations are considered in Chapter 14: *Surface water and flood risk* of this PEIR.

Other generic impacts identified in the NPS

5.91. The NPS refers (NPS paragraph XX) to the potential effects of a NSIP on other matters including:

- Civil aviation and defence interests
- Coastal change
- Land instability

5.92. These environmental impacts are not relevant to the HNRFI.

5.93. The 2020 Scoping Opinion made reference to the following potential impacts:

Residues and emissions

5.94. The 2020 Scoping Opinion states that specific reference should be made to water, air, soil and subsoil pollution, noise, vibration, light, heat, radiation and quantities and types of waste produced during the construction and operation phases, where relevant. The

considerations including proposed mitigation are addressed in the following chapters of the PEIR:

- Chapter 9: *Air quality*
- Chapter 10: *Noise and vibration*
- Chapter 14: *Hydrogeology*
- Chapter 15: *Surface water and flood risk*
- Chapter 16: *Geology, soils and contaminated land*
- Chapter 17: *Materials and waste*
- Chapter 18: *Energy and climate change*

Health Impact Assessment

5.95. The 2020 Scoping Opinion confirmed that health impacts are addressed in the assessment of impact on air quality (Chapter 9); noise and vibration (Chapter 10); flood risk (Chapter 15); hydrogeology (Chapter 14); contamination (Chapter 16) of this PEIR. HIA assessment is made during both the construction and operational phases of the development.

Risks of major accidents and / or disasters

5.96. The likely significant effects resulting from accidents and disasters applicable to HNRFI are addressed in the context of the vulnerability of the Proposed Development to a potential accident or disaster, and also the Proposed Development's potential to cause an accident or disaster. Assessment has been made of the potential significant effects resulting from the risks to human health, cultural heritage or the environment. These potential impacts are considered in Chapter 19: *Major accidents and disasters* of this PEIR.

Climate and climate change

5.97. The ES is required to include a description and assessment of the likely significant effects of the Proposed Development has on climate and the vulnerability of the project on climate change. These considerations are addressed at Chapter 18: *Energy and climate change* of this PEIR.

National Planning Policy Framework (NPPF, July 2021)

5.98. The NPS (NPS paragraph 1.18) states that the NPPF is likely to be an important and a relevant consideration in decisions on nationally significant infrastructure projects, but only to the extent relevant to an individual project. As stated, the NPPF does not contain policies specifically concerning NSIPs. The policy statements from the NPPF which are considered relevant to the environmental impact assessment for the HNRFI project are set out below.

5.99. The NPPF makes clear that the purpose of the planning system is to contribute to the achievement of sustainable development, the achievement of which has three overarching objectives. These are interdependent and need to be pursued in mutually supportive ways (NPPF paragraph 8). These objectives are:

- An economic objective
- A social objective
- An environmental objective

5.100. The NPPF requires decisions to play an *'active role in guiding development towards sustainable solutions'*, but in doing so to take local circumstances into account to reflect *'the character, needs and opportunities of each area'*. (NPPF paragraph 9) The policy guidance from the following sections of the NPPF are material to the assessment of the Proposed Development and have been taken into account in the corresponding chapters of this PEIR:

- Section 6: *Building a strong competitive economy*
- Section 9: *Promoting sustainable transport*
- Section 12: *Achieving well-designed places*
- Section 14: *Meeting the challenge of climate change, flooding and coastal change*
- Section 15: *Conserving and enhancing the natural environment*
- Section 16: *Conserving and enhancing the historic environment*

5.101. NPPF Section 6 states *'planning policies and decisions should help create the conditions in which businesses can invest, expand and adapt'.* Significant weight should be placed on the need to support economic growth and productivity, taking into account both local business needs and wider opportunities for development (paragraph 81). Paragraph 83 states that planning policies and decisions *'should recognise and address the specific locational requirements of different sectors. This includes making provision for… storage and distribution operations at a variety of scales and in suitably accessible locations.'*

5.102. NPPF Section 9 states in considering development proposals, it should be ensured that:

a) the potential impacts of development on transport networks can be addressed;
b) opportunities from existing or proposed transport infrastructure, and changing transport technology and usage, are realised – for example in relation to the scale, location or density of development that can be accommodated;
c) opportunities to promote walking, cycling and public transport use are identified and pursued;
d) the environmental impacts of traffic and transport infrastructure can be identified, assessed and taken into account – including appropriate opportunities for avoiding and mitigating any adverse effects, and for net environmental gains; and
e) patterns of movement, streets, parking and other transport considerations are integral to the design of schemes, and contribute to making high quality places. (paragraph 104)

5.103. NPPF Paragraph 111 states that:

'Development should only be prevented or refused on highways grounds if there would be an unacceptable impact on highway safety, or the residual cumulative impacts on the road network would be severe.'

5.104. Section 12 states (NPPF paragraph 126) that:

> *'Good design is a key aspect of sustainable development, creates better places in which to live and work and helps make development acceptable to communities. Being clear about design expectations, and how these will be tested, is essential for achieving this. So too is effective engagement between applicants, communities, local planning authorities and other interests throughout the process.'*

5.105. The NPS paragraphs 4.28 – 4.35 sets out criteria for 'good design' for national networks infrastructure. These principles are addressed in the accompanying Design and Access Statement.

5.106. The policy guidance at Section 14 is relevant to HNRFI in the context of the challenge to climate change and flooding. New development should be planned for in ways that avoid increased vulnerability to the range of impacts arising from climate change; and can help to reduce greenhouse gas emissions, such as through its location, orientation and design. (NPPF paragraph 154)

5.107. In respect of planning and flood risk inappropriate development in areas at risk of flooding should be avoided by directing development away from areas at highest risk. Where development is necessary in such areas, the development should be made safe for its lifetime without increasing flood risk elsewhere. (paragraph 159)

5.108. The NPS states (paragraph 5.93) that the Flood Risk Assessment (FRA) should identify and assess the risks of all forms of flooding to and from the project and demonstrate how these flood risks will be managed taking climate change into account. Flood Risk is addressed at Chapter 15: *Surface water and flood risk* of the PEIR. The policy implications of a small area of land within the main HNRFI site being within Flood Zone 3 is addressed in the Planning Statement.

5.109. The provision of buildings for storage and distribution are classified as being 'less vulnerable' to flood risks. (Table 2 Flood Risk Vulnerability Classification PPG Paragraph 066 Reference ID 7-066-20140306). Table 3 Flood Risk Vulnerability and Flood Zone 'Compatibility' identifies this land use being appropriate within Flood Zone 2 and Flood Zone 3a.

5.110. Section 15 states that planning policies and decisions should contribute to and enhance the natural and local environment through a range of policy objectives (paragraph 174). Policy guidance for the protection and enhancement of biodiversity is provided by applying the principles set out at paragraph 180. These policy considerations are addressed at Chapter 11 and Chapter 12.

5.111. Section 16 sets out the approach to be taken in considering potential impacts on the historic environment. 'Great weight' should be given to the assets' conservation. This is

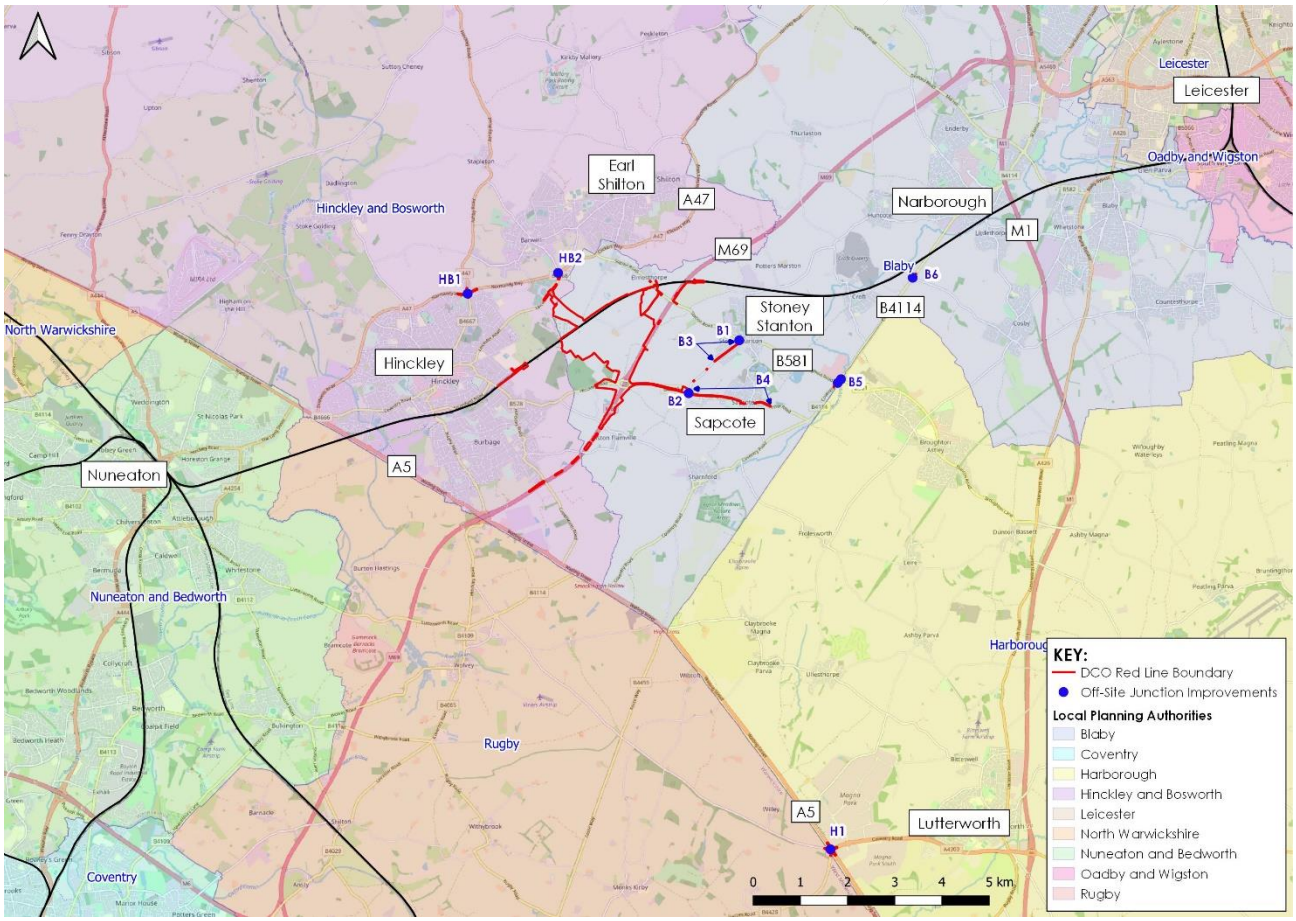
irrespective of whether any potential harm amounts to substantial harm, total loss or less than substantial harm to the significance of the asset (paragraph 199).

5.112. These considerations are consistent with the Applicant's assessment that is required in the NPS (paragraphs 5.126 – 5.127) and addressed at Chapter 13: *Cultural heritage* of the PEIR.

LOCAL PLANNING POLICY

5.113. The Main HNRFI Site lies wholly within Blaby District. The Proposed Development includes the A47 Link Road which lies partly in Blaby District and partly in Hinckley and Bosworth Borough. Figure 5.2 illustrates the administrative boundaries. The highway mitigation works beyond the main HNRFI site are located within Blaby District, Hinckley and Bosworth Borough, Harborough District and Rugby Borough.

Figure 5.2 – Plan showing administrative boundaries



Source: BWB Consulting

Blaby District

5.114. The development plan for Blaby District comprises:

- the Local Plan Core Strategy adopted February 2013, which sets out the vision, objectives, strategy and core policies up to 2029;
- the Local Plan Delivery Development Plan Document (DPD) adopted February 2019, which includes site allocations and development management policies
- the Leicestershire Minerals and Waste Local Plan adopted 2019 for the period up to 2031;
- the Fosse Villages Neighbourhood Plan made June 2021.

The Local Plan Core Strategy 2013

5.115. The Core Strategy Key Diagram identifies the HNRFI Site and A47 Link Road as being situated in countryside (Policy CS18). The countryside designation encompasses those areas of the District which are outside the limits to built development and are not subject to other designations. The policy seeks to prevent built development that would have a '*significantly adverse effect on the character or appearance of the landscape*'. Policy CS18 recognises *'the need to retain countryside will be balanced against the need to provide new development in sustainable locations'*.

5.116. Other planning policies from the Core Strategy for consideration include:

- ***Policy CS1 Strategy for locating new development***. This policy sets out the strategic objectives for spatial policies for the plan period up to 2029. The Core Strategy explains that spatial planning policy goes beyond traditional land use planning and seeks to integrate policies for the development of land with other policies and programmes which influence the nature of places and how they function. This is a policy provision that is specific to the provision of development to meet the needs of the District. Policy CS1 does not address development that responds to a national need.

- ***Policy CS2 Design of new development***. The strategic objectives of this policy are in summary form:

  i. to improve the design quality of all new development;
  ii. to protect the important areas of the District's natural environment;
  iii. to preserve and enhance the cultural heritage of the District.

5.117. These considerations are relevant to all forms of development, and have been taken into account in the master-planning and design of the HNRFI, as explained within later chapters of this PEIR. It has to be recognised that the form and scale of the development for a strategic rail freight interchange necessarily imposes limitations upon design and its local context.

- ***Policy CS6 Employment***. This policy states that Blaby District Council will work

proactively with partners to ensure that the District has a range of employment opportunities to meet the needs of its residents and wider communities, allowing for growth of existing businesses and for inward investment particularly in the 'priority' employment sectors. The policy similarly seeks to ensure provision is made for an *'appropriate quantity, quality and mix of employment opportunities'* to meet the needs of the District. As a consequence, the policy provision is not addressing NSIPs which serve a national need, and can provide a substantial source of employment.

- ***Policy CS10 Transport Infrastructure***. The main strategic objectives of this policy that are relevant to the proposal is to encourage and develop the use of more sustainable forms of transport, by reducing the need to travel by private car. New development should be located where people can access services and facilities without reliance upon private motor vehicles. Chapter 8: *Transport and traffic* of this PEIR addresses transport considerations arising from the HNRFI.

- ***Policy CS11 Infrastructure Services and Facilities to support growth***. This policy seeks to ensure that new development is supported by the required physical, social and environmental infrastructure at the appropriate time. Later chapters of this PEIR set out the scope of mitigation proposed in response to specific environmental effects of the HNRFI.

- ***Policy CS12 Planning Obligations and Developer Contributions***. This policy seeks to ensure that where requirements for infrastructure, services and facilities arise from new development, that developers contribute towards their provision. This arrangement is provided by Planning Obligations pursuant to S106 of the Act. All planning obligations have to satisfy the statutory tests set out at Regulation 122 of the Community Infrastructure Regulations 2010, namely:

    a) necessary to make the development acceptable in planning terms;
    b) directly related to the development; and
    c) fairly and reasonably related in scale and kind to the development.

- ***Policy CS14 Green Infrastructure.*** This policy seeks to protect existing, and provide new networks of multi-functional green spaces. The relationship of the proposed development to the Aston Firs – which is identified as Green Infrastructure in the Delivery DPD (see below) is addressed in Chapter 12: *Ecology and biodiversity* of the PEIR relating to biodiversity and landscape impacts.

- ***Policy CS19 Biodiversity and Geodiversity***. The underlying purpose of this policy is to protect the Blaby District's natural environment and to enhance biodiversity.

- ***Policy CS20 Historic environment and culture***. The underlying purpose of this policy is for the Council to apply a positive approach to the conservation heritage assets and the wider historic environment.

- ***Policy CS21 Climate Change***. This policy sets out Blaby District Council's commitment

to tackling climate change by shaping development in ways that reduce greenhouse gas emissions and minimise vulnerability and provide resilience to its effects. These considerations have been addressed in the master-planning for the HNRFI and are described at Chapter 18: *Energy and climate change* of this PEIR.

- ***Policy CS22 Flood Risk Management***. This policy seeks to ensure that development minimises vulnerability and makes provision for resilience to flooding, taking into account climate change. These considerations are addressed at Chapter 14: *Surface water and flood risk* of this PEIR.

- ***Policy CS23 Waste***. In the context of new developments this policy seeks to encourage waste minimisation, and identifies criteria to achieve this objective, including the application of a hierarchy of waste management. This hierarchy has a priority order of waste – prevention, re-use, recycle / compost, recovery and disposal as a last resort. These considerations are addressed at Chapter 17: *Materials and waste* of this PEIR.

5.118. Policies in emerging development plans may be given weight as a material consideration depending upon the stage of plan preparation, the extent to which there may be unresolved objections, and the degree of consistency with national planning policies. The emerging plans may have progressed beyond the consultation stage at the examination of the DCO application for the HNRFI. The provisions of any later published stages of the local plan and the assessment of the policy statements will be considered as appropriate.

The Blaby Local Plan Delivery DPD 2019

5.119. The Proposals Map from the Local Plan Delivery DPD identifies Aston Firs, to the south west of the Main HNRFI Site, as being a Green Infrastructure Asset under Policy CS14. The boundary of Burbage Common as a Local Nature Reserve is shown on the Policies Map under Policy CS19.

5.120. Policy DM2 *Development in the Countryside* states that development proposals consistent with Policy CS18 will be supported, where the following general criteria are met, in summary form:

a) The development is in keeping with the appearance and character of the existing landscape development form and buildings.

b) The development provides a satisfactory relationship with nearby users that would not be significantly detrimental to the amenities enjoyed by existing or new occupiers.

5.121. Policy DM2 makes reference to the Council's policy relating to Green Wedges (Policy CS16) or Areas of Separation (Policy CS17). Neither the Core Strategy Key Diagram or the DPD Delivery Plan Policies Map locate any part of the proposed development within a Green Wedge or Area of Separation within Blaby District.

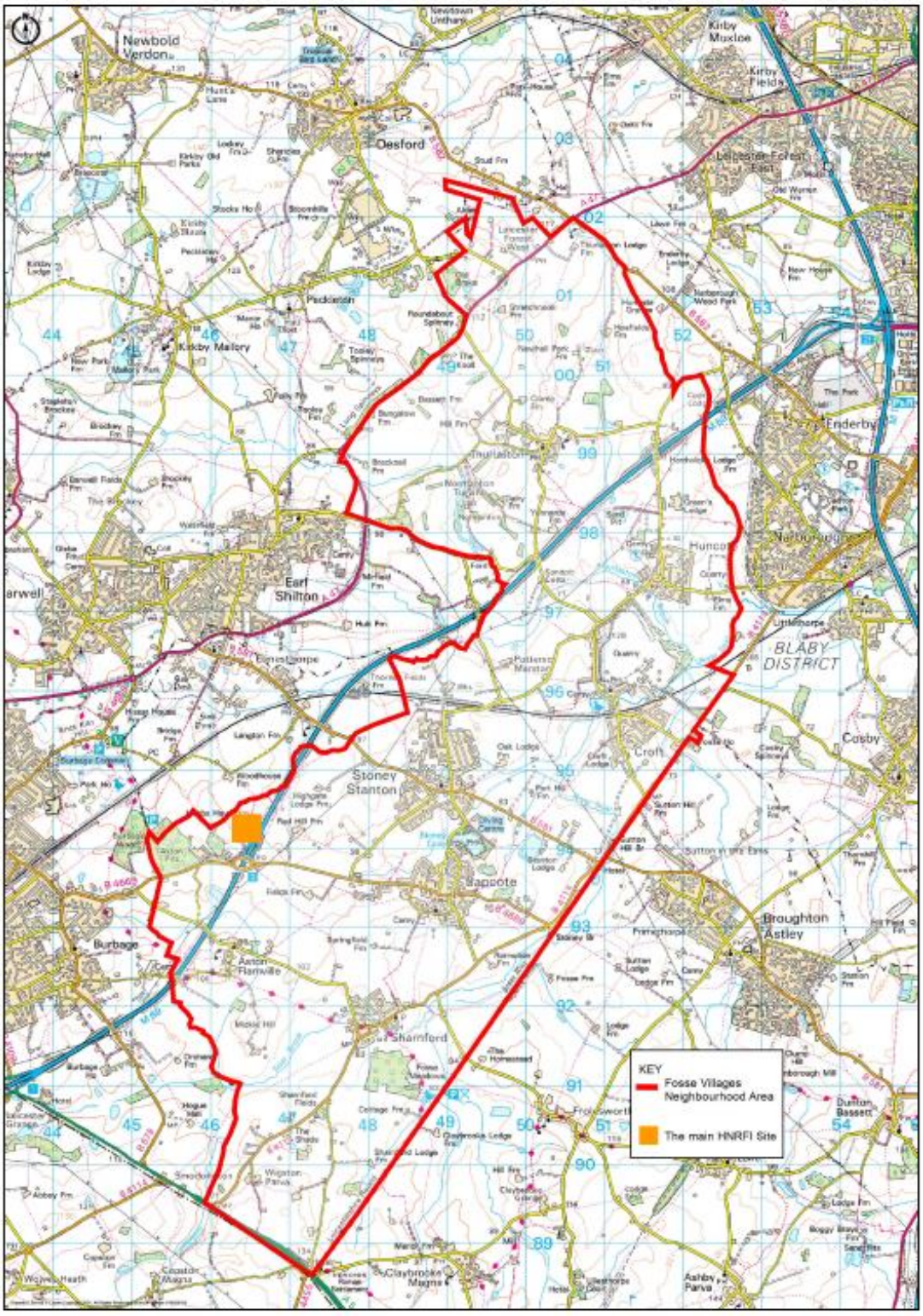
5.122. Policy DM7 Road Related Facilities for HGVs states that major development proposals that include mainly B8 uses *'will include provision of an appropriate scale for road related facilities for HGV drivers, including toilets and secure parking within the development site'*. Provision is made for these facilities within the main HNRFI site.

5.123. Development Management Policy 12 relates to Designated and Non-Designated Heritage Assets.

The Fosse Villages Neighbourhood Plan

5.124. The Neighbourhood Plan area comprises ten parishes within the south-west part of Blaby District (Croft; Huncote; Sapcote; Sharnford; Stoney Stanton; Harlecote; Aston Flamville; Leicester Forest West; Potters Marston and Wigston Parva). The Neighbourhood Plan boundary is identified below. A small part of the plan boundary extends to the west side of the M69 Junction 2 and includes Aston Firs and adjoining sites, the A47 Link Road, and part of the development area. The Plan area is shown at Figure 5.3 below.

Figure 5.3 – Neighbourhood Plan Area



5.125. The Neighbourhood Plan acknowledges the proposals for a 'rail freight hub' (paragraph 50). The Plan refers to land being safeguarded for a railway station at Station Road Croft (Policy FV2: Rail). It is subsequently stated (paragraph 60):

'An alternative site could be provided in Elmesthorpe in connection with the proposed Rail Freight Terminal development scheme.'

5.126. TSH responded to earlier stages of the preparation of the Neighbourhood Plan to inform that it was not realistic for provision to be made for a passenger station as part of the HNRFI proposals.

5.127. No spatial policies are identified within the Neighbourhood Plan on land that is proposed for the HNRFI. A local Green Space (SA2) Sapcote War Memorial is identified in a small area of woodland east of Aston Firs.

Elmesthorpe Neighbourhood Area

5.128. In the designation of the Fosse Villages Neighbourhood Area (2013), the plan area included the parish of Elmesthorpe. Elmesthorpe Parish Council subsequently withdrew from the Fosse Villages Plan. The Elmesthorpe Parish has been redesignated as the Elmesthorpe Neighbourhood Area, which includes the main development site for HNRFI. The Neighbourhood Plan has not been progressed beyond this designation.

Emerging plan: New local plan

5.129. During January – March 2021, Blaby District Council published the Regulation 18 consultation draft for the period of the next 15 years. The consultation refers to HNRFI in saying that the local plan will need to assess the implications of a SRFI close to Junction 2 of the M69 (paragraph 4.4.4). This assessment will include the employment implications (paragraph 4.2.7).

5.130. The consultation further refers to comments received in the earlier stages of the plan making process, including larger proposals *'Strategic Sites are likely to have impacts on the Strategic and Local Highway Network and will require substantial mitigation.'* Thereafter it is stated *'these include potential sites at Hinckley Rail Freight Interchange'* (page 54).

Hinckley and Bosworth Borough

5.131. The development plan within Hinckley and Bosworth Borough comprises:

- The Core Strategy DPD adopted December 2009 for the plan period to 2026;
- The Site Allocations and Development Management Policies DPA – adopted July 2016. the Leicestershire Minerals and Waste Local Plan adopted 2019 for the period up to 2031;

5.132. Other statutory development plans adopted by the Borough are not relevant to the proposed development (Hinckley Town Centre Area Action Plan; Earl Shilton and Barwell AAP DPD).

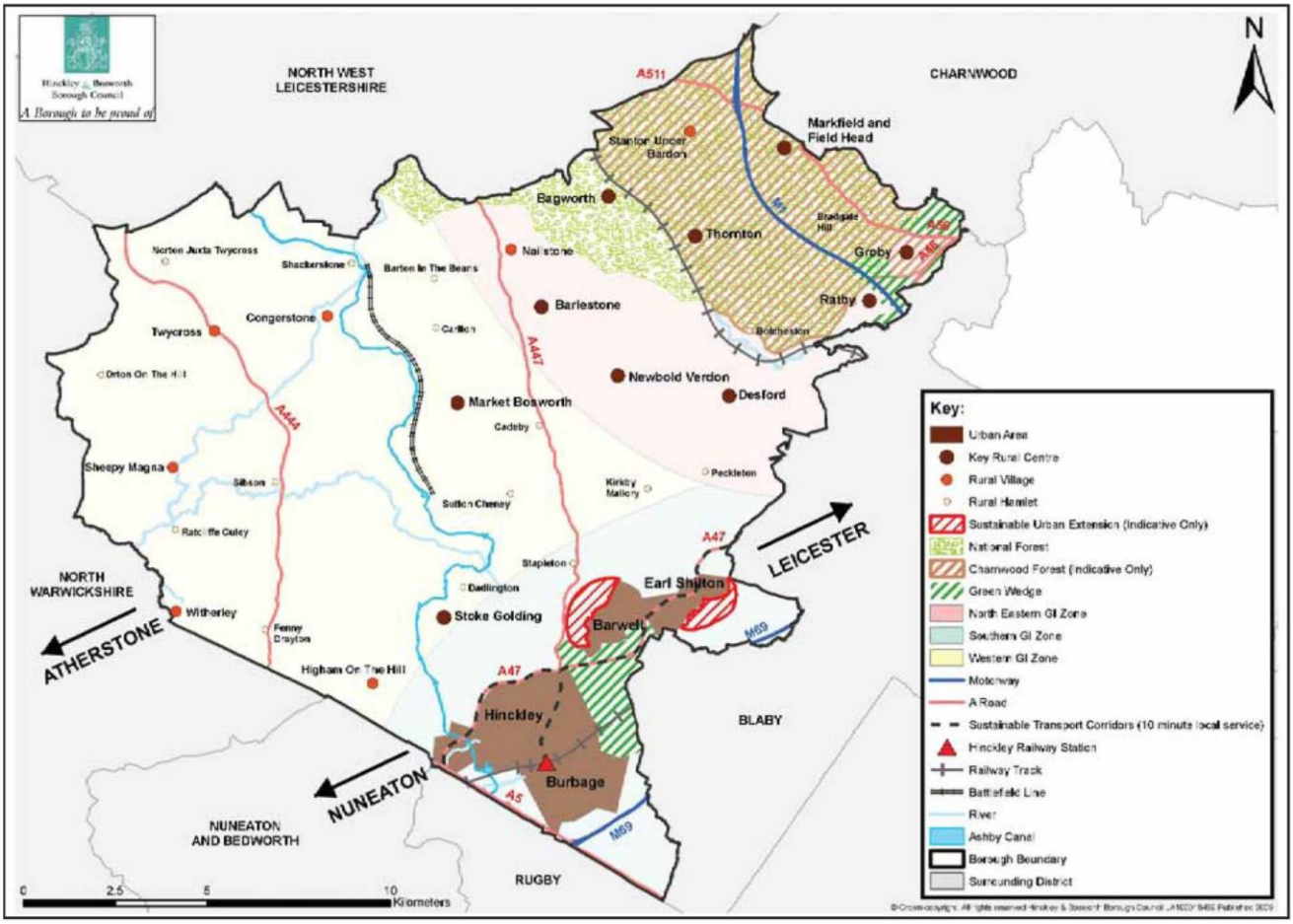
Core Strategy DPD

5.133. The proposed A47 Link Road passes through an area of land that is shown on the Key Diagram as a Green Wedge. ***Policy 20 Green Infrastructure*** states that the implementation of the Green Infrastructure Network as outlined on the Key Diagram is a key priority for the Council. The Green Wedge in which the proposed A47 Link Road is routed is described under Policy 20 as:

'Hinckley/Barwell/Earl Shilton/Burbage Green Wedge - Maintain the green wedge between Hinckley and Barwell as it plays an important environmental and landscape protection role. Look to develop it into a large-scale recreational asset to service the Sustainable Urban Extensions and residents living in North Hinckley.'

5.134. The Green Wedge is shown on the Key Diagram below in Figure 5.4 of this PEIR.

Figure 5.4 – Key Diagram showing Green Wedge



5.135. Policy 6 identifies a range of land uses that will be acceptable in the Green Wedge. Policy 6 states:

'Any land use or associated development in the Green Wedge should:
(a) Retain the function of the Green Wedge
(b) Retain and create green networks between the countryside and open spaces within the urban areas
(c) Retain and enhance public access to the Green Wedge, especially for recreation and
(d) Should retain the visual appearance of the area.'

5.136. The Core Strategy includes a plan titled 'Strategic GI Plan' which identifies a large zone of land (extending across into Blaby District) as a Biodiversity Improvement Area. 'Key interventions' referred to on the Southern GI Zone plan include:

1: Burbage Common and Woods
10: Cross Border Co-operation

5.137. Reference is made in Policy 20 to the strategic intervention for Burbage Common and Woods stating:

'Increase the size of the site to increase both the community value and biodiversity holding capacity and improve access to the site, particularly for pedestrians and cyclists.'

5.138. Chapter 11: *Landscape and visual effects* of the PEIR considers the impact of the A47 Link Road on the underlying purpose of the Green Wedge designation. The proposal for the HNRFI includes the provision for some 22.66 hectares of land adjoining Burbage Common which will be open and contribute towards the achievement of a biodiversity net gain.

5.139. ***Core Strategy Policy 5: Transport Infrastructure in the Sub-regional Centre*** seeks to promote sustainable development particularly with new transport linkages including public transport, walking and cycling. Support is provided for the re-opening of the Elmesthorpe passenger railway station to serve East Shilton and Barwell.

5.140. The Council has undertaken a public consultation exercise (Regulation 18) on the draft Local Plan for the period 2020 – 2039 during June – August 2021. The draft Plan makes reference to the HNRFI (paragraphs 8.38 – 8.39) and states that *'The Borough Council have expressed concerns over the proposals and we will want to consider the wider implications on the borough, in particular the natural environment and transport infrastructure once further details are known and a formal application made'.*

Site Allocations and Development Management Policies DPD

5.141. There are no allocations in the DPD which relate to the land within Hinckley and Bosworth Borough for the provision of the A47 Link Road. The following development management policies are considered relevant to the provision of the A47 Link Road.

5.142. *Policy DM4 Safeguarding the Countryside and Settlement Separation.* The underlying purpose of this policy is to protect the intrinsic value, beauty, open character and landscape character. The policy states that the 'countryside will first and foremost be safeguarded from unsuitable development'. The policy identifies forms of development which will be considered sustainable.

5.143. The impact of the proposed development upon the underlying policy objective of Policy DM4 is considered at Chapter 11: *Landscape and visual effects* of this PEIR.

5.144. Policy DM6 Enhancement of biodiversity and geological interest. This policy states that development proposals must demonstrate how they conserve and enhance features of nature conservation and geological value, including proposals for their long-term management. These policy considerations are addressed at Chapter 12: *Ecology and biodiversity.*

5.145. Policy DM7 *Preventing Pollution and Flooding*. These policy considerations are addressed at Chapter 15: *Surface water and flood risk*.

5.146. Policy DM11 *Protecting and enhancing the historic environment*; Policy DM12 *Historic assets*; Policy DM13 *Preserving the Borough's archaeology*. These policy considerations are addressed at Chapter 13: *Cultural heritage*.

5.147. Policy DM17 *Highways and transportation*. This policy states that development will be supported where a range of transportation criteria are satisfied. These considerations are addressed at Chapter 8: *Transport and traffic*.

Emerging Plan: Local Plan Review 2020 to 2039

5.148. In June 2021 Hinckley and Bosworth Borough Council published the Regulation 18 consultation draft plan for the period 2020 – 2030. The consultation refers to the HNRFI at paragraphs 8.38 – 8.39, stating:

'… the Borough Council have expressed concerns over the proposals and we will want to consider the wider implications on the borough, in particular the natural environment and transport infrastructure once further details are known and a formal application made.'

Harborough District

5.149. The relevant part of the development plan within Harborough District comprises:

- Harborough Local Plan 2011 – 2031, adopted April 2019

5.150. Development associated with the HNRFI within Harborough District is confined to highway improvements at the Cross in Hand roundabout off the A5 with the A4303 (Lutterworth Road). This junction adjoins Magna Park which is a Strategic Distribution site under Policy

BE2. Policy BE2 allocates land north and west of Magna Park for strategic distribution. The transport assessment for the HNRFI has taken account of the transport considerations arising from the committed development at Magna Park.

5.151. In so far as the development within Harborough District involves works to accommodate the traffic impact of the HNRFI, and the rerouting of traffic on the wider highway network (as a consequence of the provision of the south facing slips at Junction 2 M69) the following policy is a relevant consideration:

- Policy IN2 Sustainable Transport

5.152. Chapter 15 of the Local Plan Lutterworth refers to the concern of through traffic, particularly HGV movements being a local concern and the town centre is an Air Quality Management Area. These considerations are addressed in Chapter 8: *Transport and Traffic* and Chapter 9: *Air Quality*.

Rugby Borough

5.153. The relevant part of the development plan within Rugby Borough comprises:

- The Rugby Borough Local Plan adopted June 2019

5.154. Development associated with the HNRFI within Rugby Borough is confined to highway improvement at the Cross in Hand roundabout – referred to above. The proposed highway works are situated within 'open countryside'. There is no spatial allocation on the Proposals Map within the locality of the Cross in Hand roundabout.

5.155. In so far as the development within Rugby Borough involves works to accommodate the traffic impact of the HNRFI, and the rerouting of traffic on the wider highway network (as a consequence of the provision of the south facing slips at Junction 2 M69) the following policy is a relevant consideration:

- Policy HS5 Traffic generation. Air Quality, Noise and Vibration

5.156. The impact of the proposed highway improvements in the context of Policy HS5 are considered in the following chapters of the PEIR:

- Chapter 9: *Air Quality*
- Chapter 10: *Noise and Vibration*

Leicestershire Minerals and Waste Local Plan

5.157. The Leicestershire Minerals and Waste Local Plan was adopted in September 2019. The Local Plan addresses the need to provide protection to the environment and the amenity of local residents, whilst ensuring a steady supply of minerals and the provision of waste management facilities.

5.158. There are no mineral safeguarding provisions relating to mineral reserves that impact on the main HNRFI site or to the land west of the railway for provision of the A47 Link Road. The Local Plan contains policies for the provision of waste management facilities. The Local Plan does not contain policies other than those related to waste management capacity in the county. These policies are not directly relevant to the HNRFI. No waste sites are situated within the main HNRFI site, or the land for the A47.

NON-STATUTORY DOCUMENTS

5.159. Other non-statutory documents provide a planning context for the HNRFI, including:

- Leicester and Leicestershire Growth Plan December 2018
- Blaby District Growth Plan 2018
- *Warehousing and Logistics in Leicestershire: Managing growth and change* in April 2021
- Midlands Connect Transport Strategy January 2021
- emerging Local Plans

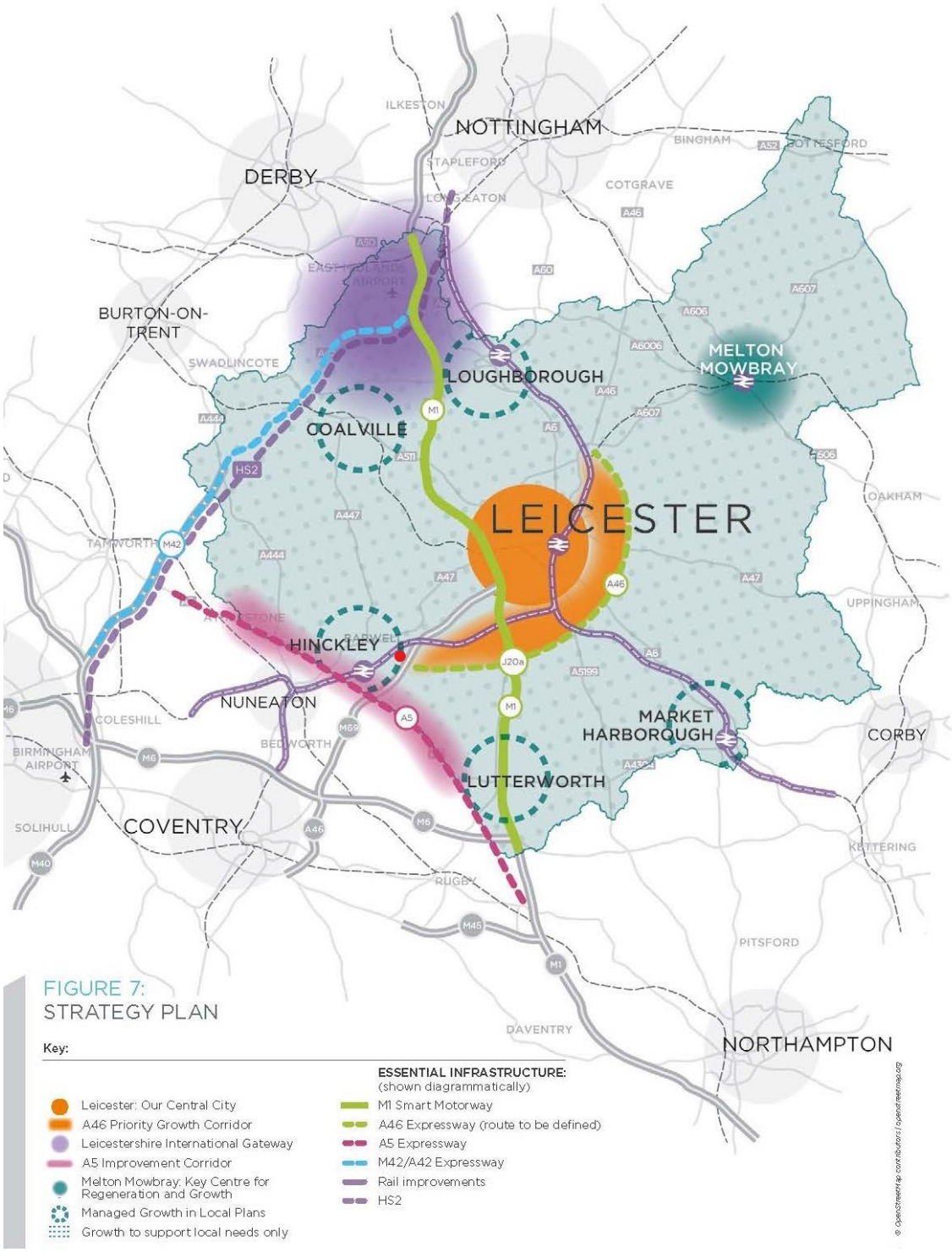
The provisions of these documents are addressed in the accompanying Planning Statement.

Leicester and Leicestershire Growth Plan

5.160. The Growth Plan December 2018 has been developed by a partnership made up of Leicester City Council, Leicestershire County Council, the seven local borough and district authorities and the LEP. Following consultation, a revised plan has been approved by all partners to help shape the local plans that the city, borough and district councils are preparing or reviewing. The Strategic Growth Plan will also be used to support bids for government funding to deliver the infrastructure needed to support growth. The Growth Plan is not a statutory development plan.

5.161. The Growth Plan is shown in Figure 5.5 below with the location of the HNRFI marked with a red dot.

Figure 5.5 – Growth Plan



5.162. The Growth Plan identifies employment land needs at Table 3 and states by way of explanation:

'In addition to the needs set out in Table 3, the authorities will seek to meet the need from strategic B8 uses identified in a separate study relating to logistics and distribution.'

Warehousing and Logistics in Leicestershire: Managing growth and change

5.163. The *Warehousing and Logistics in Leicestershire: Managing growth and change* report was published in April 2021. The findings are summarised below.

5.164. The report was commissioned by the Leicester and Leicestershire authorities and the LEP. GL Hearn in partnership with MDS Transmodal and Iceni Projects has prepared the report which follows previous studies commissioned by the Leicester and Leicestershire authorities during 2013 (Leicester and Leicestershire Strategic Distribution Study).

5.165. The report provides a comprehensive and up to date analysis of the strategic distribution sector, defined as units of 9,000 sq. metres and above, and the factors which will impact on the sector's future operation. In addition to using data from a wide range of sources, the consultant team engaged with developers and agents to gain insight into the operation of the property market for this sector. An important output of the report is the assessment of how much additional floorspace is likely to be needed for rail-served and road-served strategic distribution covering the period 2020 to 2041.

5.166. The report identifies drivers for change in the domestic logistics market, summarised as being:

- The growth of e-commerce;
- Zero emissions road and rail freight vehicles; and
- Disruptive new technologies (these are described as being):
  - The development of urban consolidation centres
  - Retiming urban freight deliveries
  - New methods for the 'last minute'.

5.167. The report estimates that there is presently a supply of circa 1.8 million sqm of logistics floorspace supply across Leicestershire– equivalent to around 6.9 years' supply based on the past annual average take up of floorspace (paragraph 6.5). No account has been taken of the potential supply from the proposed HNRFI.

5.168. The report considers a scenario with a much greater proportion of future large scale logistics buildings being located at rail served sites than previous forecasts undertaken by Network Rail. The consultants identify the following drivers for change:

1. National planning policy. Reference is made to the NPS and NPPF.
2. The large growth rates over the past decade in intermodal freight particularly on flows from the deep-sea ports to the Midlands and north of England.
3. The ability to access cost competitive rail freight services, as an increasingly key commercial requirement of the logistics sector, particularly for medium – longer distance trunk hauls between ports, national and regional distribution centres.

4. The de-carbonising agenda and the long term need to decarbonise road and rail freight.

5.169. The Study identifies the following key findings and recommendations to the commissioning partnership in planning for future floorspace, namely:

- It is recommended that the authorities plan for around 2,570,000sqm of additional floorspace permission to 2041.
- The balance of needs to 2041 (road and rail) is 1,160,000sqm, after taking into account current supply, which authorities should use as a figure for planning policy requirements.
- There is a shortfall of 768,000sqm (307 hectares) at rail served sites which should be planned for.
- There is a shortfall of 392,000sqm (112 hectares) at non-rail served sites which should be planned for.

Blaby Growth Plan

5.145 Blaby District Council has issued a non-statutory Blaby Growth Plan with the ambition to 'make Blaby a great place to Live, Work and Visit'. The Growth Plan identifies the following Key Principles and Objectives namely:

- Principle 1 Infrastructure Led
- Principle 2 Integrated and Self Sustaining
- Principle 3 Active and Healthy
- Principle 4 Well Designed
- Principle 5 Well Connected
- Principle 6 Accessible Employment and Skills

Midlands Connect Transport Strategy Refresh

5.146. Midlands Connect is a partnership of LEPs and councils from across the Midlands that have come together develop and implement a strategic transport strategy for the Midlands. Midlands Connect acts as the Sub-National Transport Body for the Midlands. In January 2021, Midlands Connect published the Transport Strategy Refresh which summarises three key challenges faced by the Region namely:

- Economic recovery and growth
- Levelling up
- Climate change

5.147. The purpose of the Strategy is to inform Government what the priorities for national and regional infrastructure in the Midlands should be and crucially what local policies and programmes will support these priorities.

5.148. The Strategy supports the freight and logistics industry to decarbonise, alongside *'maximising the use of rail freight where possible'.*

CONCLUSIONS

5.149. Policy provisions relevant to the assessment of the HNRFI's environmental effects are addressed in detail in the topic-based chapters of this PEIR. TSH will continue to monitor county and local policy in order to retain an up-to-date understanding of local planning and environmental constraints and the evolving development context in the area.

5.150. The NPS is the primary source of national policy guidance for NSIP projects such as the HNRFI, as a Strategic Rail Freight Interchange. The relationship between the NPS and NPPF is explained in the NPS. The planning provisions in the NPS are consistent with the underlying commitment to the principles of securing sustainable patterns of development in NPPF. The policy guidance of the NPPF is acknowledged to be an important and relevant consideration of the HNRFI, but only to the extent relevant to this project. The development plans for Blaby or Hinckley and Bosworth have not provided for any large-scale transport facilities of the form of a SRFI.

Tritax Symmetry (Hinckley) Limited

HINCKLEY NATIONAL RAIL FREIGHT INTERCHANGE

Preliminary Environmental Information Report

Chapter 6:

EIA scope and general methodology

January 2022

This document forms a part of a Preliminary Environmental Information Report (PEIR) for the Hinckley National Rail Freight Interchange project.

A PEIR presents environmental information to assist consultees to form an informed view of the likely significant environmental effects of a proposed development and provide feedback.

This PEIR has been prepared by the project promoter, Tritax Symmetry (Hinckley) Limited. The Proposed Development is described in Chapter 3 of the PEIR and is the subject of a public consultation running from 12 January to 9 March 2022.

Details of how to respond to the public consultation are provided at the end of Chapter 1 of the PEIR and on the project website:

http://www.hinckleynrfi.co.uk/

This feedback will be taken into account by Tritax Symmetry (Hinckley) Limited in the preparation of its application for a Development Consent Order for the project.

Chapter 6 ◆ EIA scope and general methodology

INTRODUCTION

6.1. This chapter explains how the scope of the EIA has been determined and then sets out the general methodology for the assessment. Further topic-specific explanations of the assessment methodology are provided in later chapters of this PEIR. This chapter ends with an outline of the proposed structure of the ES that will accompany the DCO application for the HNRFI.

THE SCOPE OF THE EIA

Geographic scope

6.2. The geographical coverage of an EIA is defined by the area of land that may be affected by the development, the nature of the current environmental conditions and the manner in which environmental effects are likely to be generated. Whereas land within the boundary of a development site – in this case defined by the draft Order Limits shown in figures 1.1 and 1.2 of this PEIR – forms a focus of the assessment, the influence of many predicted environmental effects can extend beyond the immediate Project Site boundary. Where identified and relevant, these effects are also being assessed as part of the EIA for the project. Wider study areas relevant to individual EIA topics are defined in the chapters that follow.

6.3. The geographical extent of the EIA also takes into account the potential implications of related and unrelated development activities. The potential cumulative effects of the Proposed Development in association with other developments during construction and in operation are taken into account in individual PEIR chapters and in Chapter 19: *Cumulative, in-combination and transboundary effects*.

Temporal scope

6.4. The envisaged construction phasing for the HNRFI is outlined in Chapter 3: *Project description* of this PEIR.

6.5. The preliminary assessments presented in this PEIR are based, largely, on the comparison of anticipated environmental effects with current or recent baseline environmental conditions. This is with the exception of topics such as transport and traffic, air quality, and landscape and visual effects, which factor in future baseline changes into assessments in defined future year impact scenarios. These approaches are explained in further detail in the relevant chapters.

Technical scope

6.6. In order to ascertain the technical scope of the EIA, a scoping process has twice been

undertaken. Chapter 1: *Introduction* of this PEIR explains that TSH applied originally to the Secretary of State for an opinion on the scope of the EIA in March 2018, with the Secretary of State's EIA Scoping Opinion being published the following month.

6.7. As Chapter 1 of this PEIR explains, subsequent assessment of the effects of the Proposed Development on road traffic indicated that the scope of the EIA needed to be extended. In particular, transport modelling suggested that the proposed upgrade of M69 Junction 2 would change patterns of existing non-HNRFI-related road traffic in the locality, creating new routes on the local road network with consequential environmental effects. In response TSH requested an updated EIA scoping opinion from the Secretary of State, submitting an updated EIA scoping report on 12 November 2020. A new EIA scoping opinion was adopted by the Secretary of State on 22 December 2020 ('the 2020 Scoping Opinion').

6.8. The 2020 Scoping Opinion took into account responses from the following consultees.

- Aston Flamville Parish Council
- Blaby District Council
- Burbage Parish Council
- Cadent Gas Limited
- Earl Shilton Town Council
- Elmesthorpe Parish Council
- Environment Agency
- Forestry Commission
- Harborough District Council
- Health and Safety Executive
- Highways England
- Hinckley and Bosworth Borough Council
- Historic England
- Leicestershire County Council
- Natural England
- Nottinghamshire County Council
- Nuneaton and Bedworth Borough Council
- Public Health England
- Royal Mail Group Limited
- Sapcote Parish Council
- Sharnford Parish Council
- Solihull Metropolitan Borough Council
- SP Energy Networks
- Stoney Stanton Parish Council
- Warwickshire County Council
- Wigston Parva Parish Council

6.9. Paragraph 3.3.4 of the 2020 Scoping Opinion notes the Applicant's intention to consult relevant statutory consultees to inform and agree the ES methodology. The outcomes of this dialogue and the Applicant's response are explained in the topic-based chapters of

this PEIR.

6.10. Paragraph 3.3.9 of the 2020 Scoping Opinion advises that an ES should contain the timescales upon which the surveys which underpin the technical assessments have been based. Survey work for the HNRFI project is in progress but the dates of the survey work on which the preliminary environmental information in this report is based are identified in the topic-based chapters of this PEIR.

6.11. Paragraph 3.3.9 of the 2020 Scoping Opinion states that an ES should include details of difficulties (for example technical deficiencies or lack of knowledge) encountered compiling the required information and the main uncertainties involved. Difficulties encountered to date are identified in the topic-based chapters of this PEIR.

ASSESSMENT METHODOLOGY

EIA methodology

6.12. The ES will explain the Applicant's approach to EIA, including scoping, the collection of baseline environmental data, consultations, an assessment of likely significant environmental effects, the identification of mitigating measures, and the assessment of residual effects. The ES will identify the methods used for the collection of data and the identification and assessment of likely significant environmental effects. Any assumptions made will be clearly identified.

6.13. The detailed methodology employed for the assessment of individual environmental topics is explained at the beginning of the chapters that follow. These methodologies have the following activities in common:

- establishing the existing 'baseline conditions' – in other words the existing status of the HNRFI Site and surroundings and their environmental characteristics;
- consultation with statutory and non-statutory consultees throughout the application process – including this PEIR;
- consideration of relevant local, regional and national planning policies, guidelines and legislation relevant to EIA and to the topic;
- consideration of technical standards for the development of significance criteria;
- review of secondary information, previous environmental studies and publicly available information and databases;
- physical surveys and monitoring;
- desk-top studies;

- computer modelling;
- professional judgement.

6.14. Environmental effects will be considered on the basis of their magnitude, duration and reversibility.

Significance criteria

6.15. The significance of environmental effects arising from the construction and operation of the HNRFI, and associated infrastructure will be reported in the ES with the assistance of a series of standard matrices. The matrices will describe the sensitivity of receptors that have the potential to be affected by the Proposed Development and the magnitude of any effects that are likely to arise. The magnitude of effect and sensitivity of receptors will be cross referenced to give an overall significance of effect for any potential impact. Where it is not possible to quantify effects, qualitative assessments will be carried out, based on available knowledge and professional judgement.

6.16. The assessments will generally follow the structure and use the terminology outlined in Tables 6.1 – 6.3 overleaf, which have been used in this PEIR. Each of the following chapters of this PEIR explains how significance criteria and thresholds have been applied for the environmental topic under consideration. In a limited number of cases, significance criteria might need to differ depending on the conditions encountered at the HNRFI Site.

6.17. Potential mitigation measures will include embedded mitigation through design or standard control measures, which would be used to produce an initial assessment of effects, and any further specific mitigation that would be taken into account to produce an assessment of residual effects. These measures will be described in the ES, with provisions to ensure their implementation is included in the draft DCO.

6.18. Having regard to the character and location of the Proposed Development and in accordance with Schedule 3 of the EIA Regulations 2017, the assessment will take into account:

(a) the magnitude and spatial extent of the impact (for example geographical area and size of the population likely to be affected);

(b) the nature of the impact;

(c) the transboundary nature of the impact (see below);

(d) the intensity and complexity of the impact;

(e) the probability of the impact;

(f) the expected onset, duration, frequency and reversibility of the impact;

(g) the cumulation of the impact with the impact of other existing and/or approved development (see below);

(h) the possibility of effectively reducing the impact.

6.19. The assessment will include consideration of the interaction between environmental factors assessed, including population and human health; biodiversity; land, soil, water, air and climate; and material assets, cultural heritage and landscape.

Table 6.1: The measurement of environmental effects - receptor sensitivity

Sensitivity	Example
Very High	Internationally designated site (e.g. Ramsar / SPA / World Heritage).
High	Nationally designated site (e.g. SSSI) / designated Landscape (e.g. NP) / principal aquifer / main watercourse / human health.
Medium	Regionally designated ecology / heritage site / secondary aquifer / minor watercourse.
Low (or lower)	Locally designated ecology / heritage site; area of hardstanding / brownfield land / industrial site / site of low ecological value.
Negligible	No sensitivity to change.

Table 6.2: The measurement of environmental effects – magnitude of impact

Magnitude		Example
Major	Adverse	A permanent or long-term adverse impact on the integrity and value of an environmental attribute or receptor.
	Beneficial	Large scale or major improvement of resource quality; extensive restoration or enhancement; major improvement of attribute quality.
Moderate	Adverse	An adverse impact on the integrity and/or value of an environmental attribute or receptor, but recovery is possible in the medium term and no permanent impacts are predicted.
	Beneficial	Benefit to, or addition of, key characteristics, features, or elements or improvement of attribute quality.
Minor	Adverse	An adverse impact on the value of an environmental attribute or receptor, but recovery is expected in the short-term and there would be no impact on its integrity.
	Beneficial	Minor benefit to, or addition of key characteristics, features or elements; some beneficial impact on attribute or a reduction in the risk of a negative impact occurring.
Negligible	Adverse	Very minor loss.
	Beneficial	Very minor benefit.
No change		No change would be perceptible either positive or negative.

Table 6.3: The measurement of environmental effects – significance of effect

		Magnitude of impact				
		No change	**Negligible**	**Minor**	**Moderate**	**Major**
Receptor Sensitivity	Very high	Neutral	Slight	Moderate	Large	Very large
	High	Neutral	Slight	Moderate	Large	Large
	Medium	Neutral	Slight	Slight	Moderate	Large
	Low	Neutral	Slight	Slight	Slight	Moderate
	Negligible	Neutral	Neutral	Neutral	Neutral	Neutral

Study areas

6.20. Given the scale of the Proposed Development and the diverse nature of the environmental effects being assessed, it is not possible to define a single standard study area for all environmental topics considered. Instead, appropriate study areas have been defined and justified in the respective topic-based chapters of this PEIR, where relevant, based on recognised topic-specific guidance.

IN-COMBINATION AND CUMULATIVE EFFECTS

6.21. Schedule 4(5)(e) of the EIA Regulations 2017 requires the EIA to take into account the '*cumulation of effects with other existing and / or approved projects taking into account any existing environmental problem relating to areas of particular environmental importance likely to be affected or the use of natural resources*'.

6.22. Schedule 4(5) of the Regulations requires also that:

'The description of the likely significant effects on the factors specified in regulation 5(2) should cover the direct effects and any indirect, secondary, cumulative, transboundary, short-term, medium-term and long-term, permanent and temporary, positive and negative effects of the development.'

Methodology for cumulative assessment

6.23. The Planning Inspectorate's Advice Note 9: *Using the Rochdale Envelope* (version 3, July 2018) states that:

'The potential cumulative impacts with other major developments will also need to be carefully identified such that the likely significant effects can be shown to have been identified and assessed against the baseline position (which would include built and operational development). In assessing cumulative impacts, other major development should be identified through consultation with the local planning authorities and other relevant authorities. Applicants should have regard to the staged approach to cumulative effects assessment set out in Planning Inspectorate's Advice Note Seventeen: Cumulative Effects Assessment'.

6.24. The Planning Inspectorate's Advice Note 17: *Cumulative Effects Assessment* (version 2, August 2019) provides a four-stage approach to Cumulative Effects Assessment (CEA). This staged CEA process has been followed to identify a 'long list' and then to establish the 'short-list' of developments for the CEA in order to ensure that it is appropriately focussed and proportionate. Using the guidance provided, developments have been identified by reference to local knowledge, published information and consultation with local planning authorities in the area.

6.25. Prior to submission of the DCO application, this process and list of projects will be reviewed as part of the iterative nature of CEA, as part of the EIA. The EIA will consider the cumulative effects of the construction and operational phases of the Proposed Development.

6.26. This PEIR also considers the interrelationships between different aspects of the Proposed Development (also termed in-combination or synergistic effects). This is where receptors experience multiple potentially non-significant effects that might collectively become significant. These will be considered through a matrix-based approach.

6.27. The outputs from the CEA and interrelationship assessments identified to date are described in Chapter 18 of this PEIR.

Tritax Symmetry (Hinckley) Limited

HINCKLEY NATIONAL RAIL FREIGHT INTERCHANGE

Preliminary Environmental Information Report

Chapter 7: Land use and socio-economic effects

January 2022

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This feedback will be taken into account by Tritax Symmetry (Hinckley) Limited in the preparation of its application for a Development Consent Order for the project.

Chapter 7 ◆ Land use and socio-economic effects

INTRODUCTION

7.1 This chapter of the PEIR assesses the land use and socio-economic effects of the HNRFI project. The chapter sets out the methodology and data sources used for this assessment and analyses the socio-economic baseline conditions, including current agricultural businesses, employment in the logistics sector and the general locations where employees are likely to live. It then assesses the likely land use and socio-economic effects of the HNRFI project, taking also into account future climate changes.

METHODOLOGY AND DATA SOURCES

EIA scoping opinion

7.2 As explained in Chapters 1 and 6 of this PEIR, a revised EIA Scoping Opinion was provided by the Secretary of State in December 2020. Aspects of the scoping opinion relevant to the assessment of land use and socio-economic effects are summarised in Table 7.1 below, with the Applicant's responses included. Where the response is 'noted and agreed' the comment is not repeated. Where a fuller response is required, this is set out in **Table 7.1** below.

Table 7.1: Advice in the 2020 Scoping Opinion relevant to the assessment of socio-economic effects, and the Applicant's response

PINS ID	Ref.	Comments	Response
4.1.2	6.17 & 6.30	The [Applicant's 2020] Scoping Report states that the assessment will be consistent with the Treasury Green Book Guidance. Additional 'best practice guidance' is referred to in paragraphs 6.26 and 6.30 but it is not clear what guidance is being relied on here. All guidance followed should be clearly referenced in the ES. Chapter 5 paragraph 5.6 states that the assessment will take into account the Design Manual for Roads and Bridges (DMRB), however this is not referenced specifically in this	Guidance is clearly referenced in the PEIR. The Design Manual for Roads and Bridges (DMRB) LA 112 Population and Human Health Revision is considered in the PEIR. The relevant guidance from this document is outlined in the Guidance section (para 7.79 / Table 7.4 below). The document is also referred to throughout this assessment where the guidance is relevant.

PINS ID	Ref.	Comments	Response
		aspect chapter. The ES should consider DMRB LA 112 Population and Human Health Revision 1, which provides guidance on the likely effects of projects on land-use and accessibility including agricultural land holdings.	
4.1.3	6.10	The report does not list (or seek to scope out) the potential for effects relating to private property, community land and assets or development land and businesses. The ES should consider the direct and indirect impacts (e.g. increased demand for or reduced/altered access to community facilities) of the Proposed Development on these matters if significant effects are likely to occur.	The PEIR considers potential effects to private property, community land and assets or development land and businesses. The subsection *Private property and housing* in the *Potential environmental effects* section of this chapter considers effects to private property (para 7.176).
4.1.4	6.12	The Scoping Report applies an employment density of 77 m^2 per worker to estimate a potential 8,000 workers on site. The proposed development has the potential to accommodate a mix of regional and national distribution centre functions. The calculation of employment impacts (and related trip generation) should acknowledge the range of job densities for these functions (i.e. 77-95 m^2 per worker). Consideration of occupations/skills levels of employment created would also be beneficial.	The PEIR will acknowledge the range of employment densities and report the results accordingly. An estimate of the skill levels of employment generated will be included in the ES. The range of densities is considered in the *Employment during operation* subsection of the *Potential environmental effects* section of this chapter (para 7.151). Figure 7.8 outlines an estimate of the employment skill levels that will be required or generated by the HNRFI development.
4.1.4	6.13	The Scoping consultation responses suggest there is currently SRFI overcapacity regionally. The ES should clearly	The PEIR will clearly establish the assumptions and growth scenarios used to undertake the economic impact assessment.

PINS ID	Ref.	Comments	Response
		establish the assumptions and growth scenarios that constitute the basis for the economic impact assessment.	As outlined in the Warehousing and Logistics in Leicester and Leicestershire: Managing growth and change (2021) in Chapter 5: *Policy and need* of this PEIR, there is a forecast need of 2,751,000sqm of warehouse floorspace by 2041 (para 7.67).
4.1.6	6.14 & 6.16	The Scoping Report does not describe how the impacts on the demand for housing will be assessed. If significant effects on socio-economic receptors are likely to occur then an assessment of these needs to be included in the ES and the Applicant should ensure that the methodology and approach to the assessment in the ES is clearly established. Any assessment must differentiate between construction and operational phases as the nature of accommodation demand will differ. Demand for temporary accommodation by the construction and operational work force (including lorry parks) should be identified and an assessment made regarding the impact on local accommodation supply and affordability.	Demand for housing as a result of the Proposed Development during construction and operational phases will be assessed, with the assessment based on a clearly stated methodology. This is considered in the *Demand for housing* subsection of the *Potential environmental effects* section of this PEIR chapter (para 7.171-7.176).
4.1.7	6.18 & 6.20	The Scoping Report does not specify whether the ES will assess the impacts on landholdings from direct land take only, or other impacts such as changes to access, drainage or amenity. Elmesthorpe Parish Council highlights the potential for the alterations to the rights of way to affect equine businesses. The ES should clearly establish the extent of the potential impacts and its	The impacts on landholdings from direct land take only, or other impacts such as changes to amenity will be considered by the ES. This is considered in the Agricultural Land Holdings subsection of the Potential Environmental Effects (para 7.202).

PINS ID	Ref.	Comments	Response
		geographic scope should be defined so as to account for these.	
4.1.8	6.19	The aspect includes the assessment of several matters for which different study areas will be appropriate, as acknowledged by the range of study areas presented in the Scoping Report. The ES should clarify and justify what the study area is for each matter assessed. The choice of study area should have regard to the Leicester and Leicestershire Functional Economic Market Area (FEMA) / Housing Market Area (HEDNA, 2017), adjoining FEMA and Census based commuting data. Drawing on case examples from other local distribution centres could supplement the use of transport and census data to define the zone of influence.	The PEIR will clarify and justify the study area used for each matter assessed. The Leicester and Leicestershire Functional Economic Market Area will be considered alongside the employee trip modelling undertaken for the Proposed Development to determine the study area at the operational stage. The section of the Methodology and Data Sources outlines a relevant study area for each impact considered.
4.13.3	Table 18.1	The Scoping Report defines the zone of influence (ZOI) for this matter as extending to commuting distance of the Proposed Development. This is narrower than the study areas suggested to assess some matters falling within this aspect of the Proposed Development alone (see Scoping Report Chapter 6, paragraph 6.13). A regional geographic scope would be more appropriate.	The PEIR will consider the use of the region instead of the ZOI and justify which one is more appropriate to be used. The Study Area subsection of the Methodology considers the relevant study areas to use for each receptor.

Study area

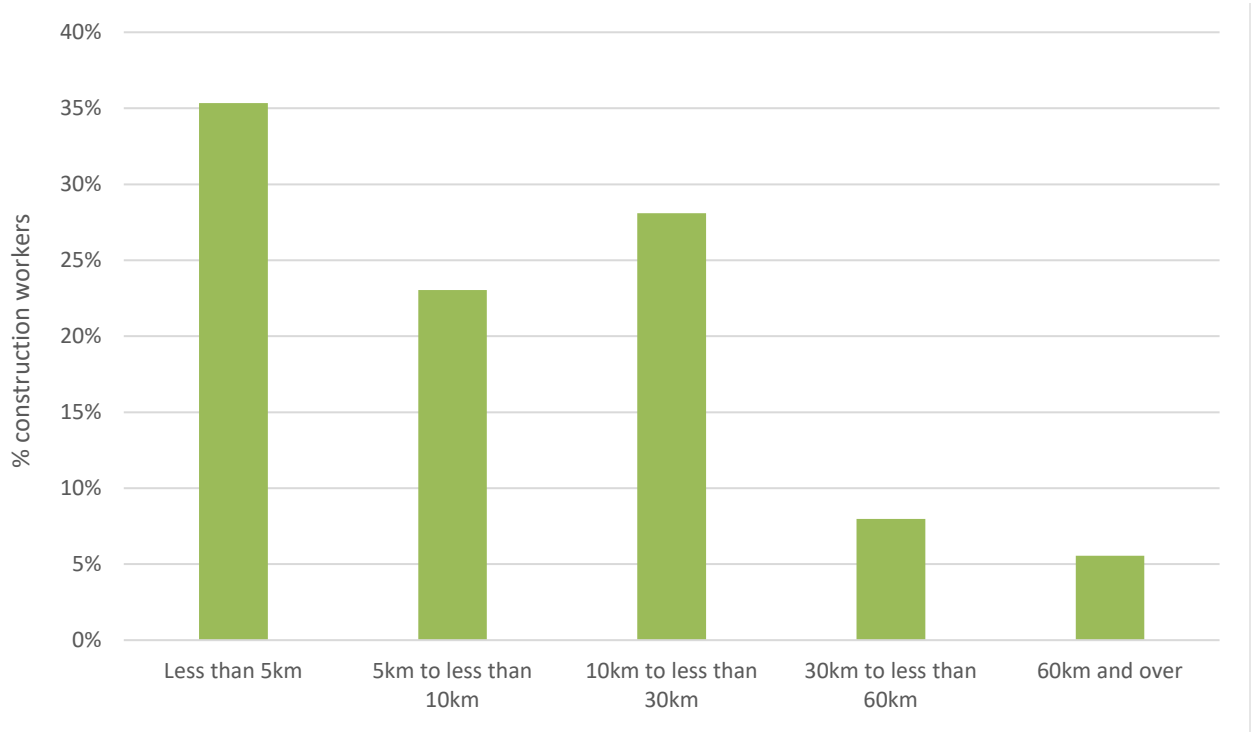
7.3 This section sets outs the study areas used to assess the likely land use and socio-economic effects.

Construction employment

7.4 The study area used for construction employment covers the local authorities of which the area primarily falls within a 30km radius from the Main Order Limits. **Figure 7.1** below

shows that the large majority of those employed in the construction sector in Leicestershire (86%) travelled less than 30km to their place of work at the time of the 2011 Census, justifying the use of the above radius as the study area.

Figure 7.1: Average distance travelled to work for those employed in the construction sector in Leicestershire, 2011

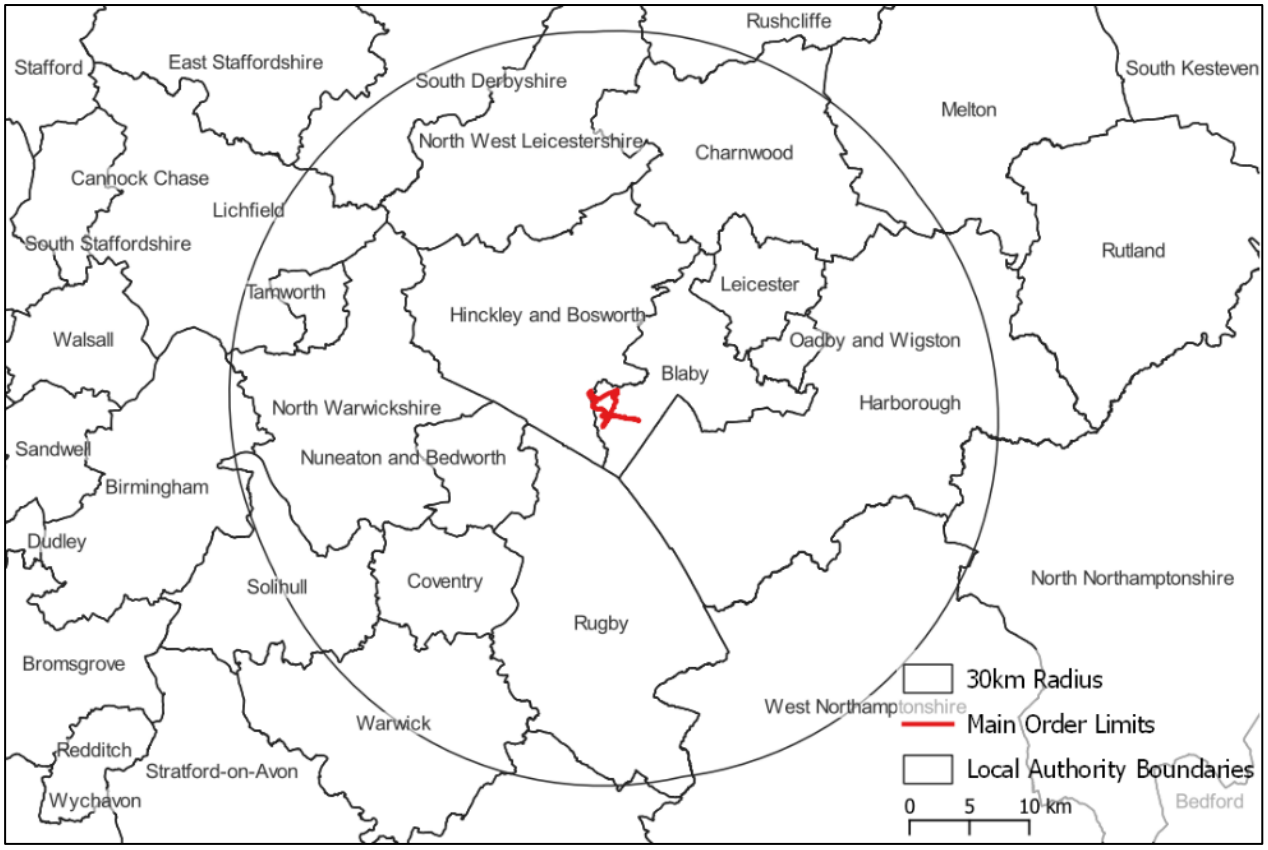


Source: Census 2011

7.5 **Figure 7.2** overlays a 30km radius from the Main HNRFI Site onto the local authority boundaries. Figure 7.2 shows that the following local authorities would be the likely residential locations for the majority of construction workers at the HNRFI project:

- Blaby District
- Charnwood Borough
- Coventry City
- Harborough District
- Hinckley and Bosworth Borough
- Leicester City
- North Warwickshire Borough
- North-West Leicestershire District
- Nuneaton and Bedworth Borough
- Oadby and Wigston Borough
- Rugby Borough
- Tamworth Borough

Figure 7.2: A 30km radius from the Main Order Limits in relation to local authority boundaries



Source: ONS, Savills 2021

7.6 These local authorities form the main area of impact that would benefit from employment opportunities during the construction of the HNRFI project.

Operational employment

7.7 The study area used for operational employment comprises the following local authorities based on the modelled HNRFI Employee Trips described below:

- Blaby District
- Charnwood Borough
- Coventry City
- East Staffordshire Borough
- Erewash Borough
- Harborough District
- Hinckley and Bosworth Borough
- Leicester City
- Melton Borough
- North Warwickshire Borough
- North-West Leicestershire District
- Nuneaton and Bedworth Borough
- Oadby and Wigston Borough

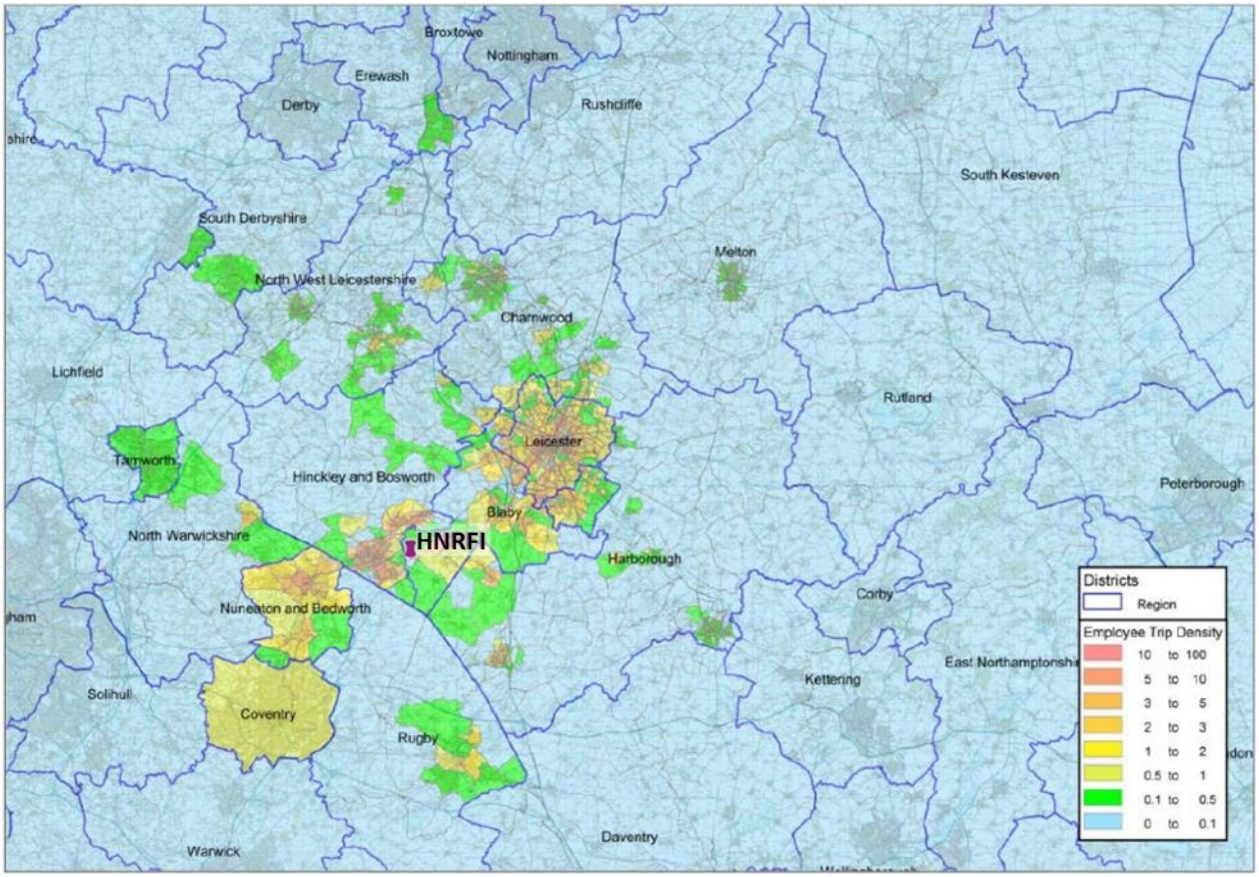
- Rugby Borough
- South Derbyshire
- Tamworth Borough

7.8 Commuting data of those that work in the logistics sector is less readily available from the Census, due to the provision of this information for industrial sector groups. Logistics is covered by 'distribution, hotels and restaurants' and 'transport and communication' industrial sector groups. 91% of workers in these two categories commuted less than 30 km to their place of work in the LLEP area in 2011; a slightly higher proportion than those in the general construction sector.

7.9 AECOM has developed the HNRFI employee trips model in 2018. This shows the likely location of HNRFI workers. Further information and details on the model are provided in **Appendix ITA 4.**

7.10 **Figure 7.3** below shows the predicted densities of employee trips to HNRFI in 2036. A higher resolution version of Figure 7.3 is provided in **Appendix ITA 4.** Local authorities with a minimum employment trip density 0.1 (average number of employee trips from and to HNRFI) are used to define the study area for operational employment. The used trip density shows all the areas where the HNRFI employees are likely to come from.

Figure 7.3: Modelled HNRFI employee trips to HNRFI in 2036 AM peak



Source: Hinckley National Rail Freight Interchange Strategic Modelling: Development Trip Distribution, December 2018

GVA during operation

7.11 Gross value added (GVA) is the measure of the value of goods and services produced in an area, industry or sector of an economy. For the current proposals, GVA will be reported at the LLEP level by using the ONS gross value added (GVA) for the LEP's dataset.

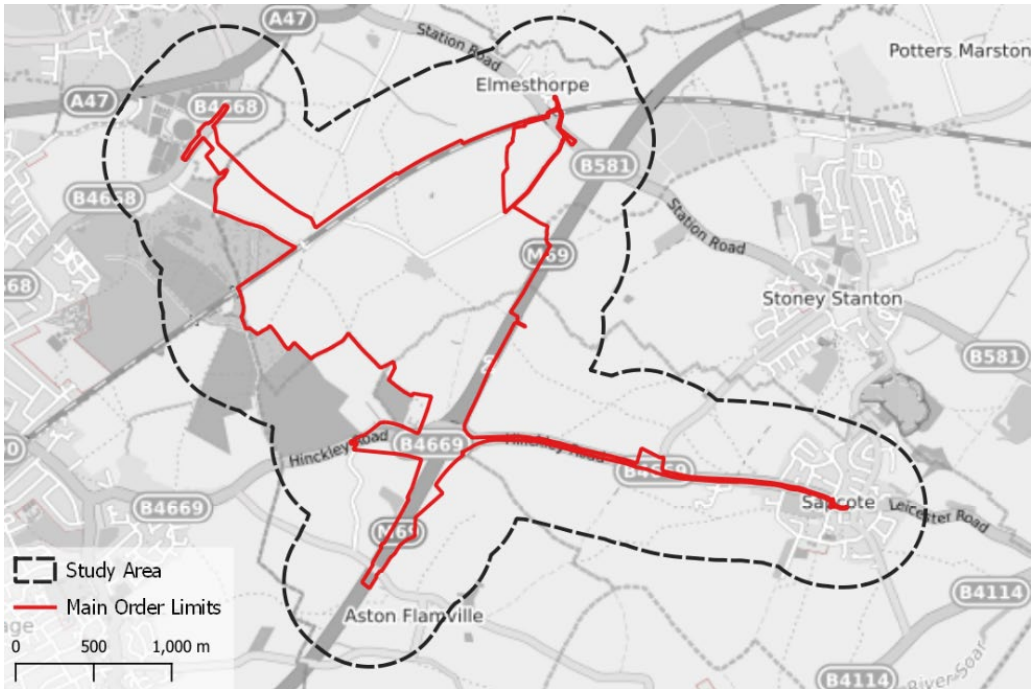
Demand for housing

7.12 The Housing and Economic Development Needs Assessment (HEDNA) 2017 considers Leicester and Leicestershire to be the relevant housing market area (HMA) for Blaby District Council. Trends and plans at the sub-regional level are disaggregated down to local authority level. While the HNRFI project is located towards the edge of the HMA, and its effects are likely to be felt in the adjacent Coventry and Warwickshire HMA as well, the economic and population projections in the HEDNA account for the dynamics between adjacent HMAs.

Land-use and accessibility

7.13 The land use aspect of this PEIR Chapter considers the effect of the HNRFI on existing businesses with landholdings in the Main HNRFI Site. The study area comprises the whole of the Main Order Limits, plus a 500m area as recommended by the Design Manual for Roads and Bridges, LA 112 Population and Human Health. Figure 7.4 below shows this study area in relation to the Main Order Limits. More information on the Design Manual for Roads and Bridges, LA 112 Population and Human Health is included in the Guidance section below.

Figure 7.4: Main Order Limits and study area for land-use and accessibility impacts



Source: Open Street Map (2021)

Data sources

7.14 Baseline information on the socio-economic conditions of the area was collated from a variety of sources, including the following:

- 2011 Census (ONS), including travel to work data;
- Business Register and Employment Survey (BRES) (ONS);
- Indices of Multiple Deprivation (IMD) (2019) (DCLG);
- CITB Construction Skills Network Forecasts (2019);
- Annual Population Survey (2020);
- Warehousing and Logistics in Leicester and Leicestershire: Managing growth and change (2021);
- Housing and Economic Demand Needs Assessment, Leicester and Leicestershire Enterprise Partnership (2017); and
- ONS Labour Productivity Measures (2020).

Approach

7.15 The steps of this chapter's methodology include:

- Effect assessment – consider the scale, magnitude, and duration, frequency and permanence of the potential effects during both the construction and operational phases of the HNRFI project.
- Consider mitigation measures, residual effects and cumulative effects in the ZOI. Summarise final effect assessment.

7.16 The above steps relate to the assessment of employment, logistics sector, housing and health effects. The employment assessment will conclude on the net additionality of the HNRFI project, after taking into account displacement, leakage, multipliers and deadweight.

7.17 For the effect on private property and housing, community land and assets, development land and businesses, and agricultural landholdings the following steps are taken:

- Effect assessment – consider the magnitude of the potential effects on businesses operating on the land and their sensitivity to permanent loss of access to land within the study area, set out by DMRB LA 112 Revision 1. Further information is provided below.
- Consider mitigation measures, residual effects and cumulative effects.
- Summarise final effect assessment.

Design Manual for Roads and Bridges, LA 112 Population and human health, Revision 1

7.18 This document, published by Highways England (now National Highways), sets out the requirements for assessing and reporting the environmental effects on population and

health from construction, operation and maintenance of highways projects.

7.19 The document reports on the population and human health effects including:

- Land-use and accessibility including;
  - private property and housing;
  - community land and assets;
  - development land and assets;
  - agricultural land holdings;
  - walkers, cyclists and horse-riders (WCH).
- Human health including;
  - health profiles of affected communities;
  - health determinants (e.g. noise or air pollution);
  - likely health outcomes.

7.20 It requires the nature and scale of effects on land use and accessibility to be deemed as beneficial, neutral, or adverse.

7.21 The recommended study area should be based on the construction footprint/project boundary plus a 500m area surrounding the project boundary. If the likely effects are identified without the 500m boundary, then the study area should be extended accordingly.

7.22 The baseline should include data on:

- private property and housing:
  - the location and number of properties at risk of demolition, or from which land will be required/access affected by a project;
  - the location of residential development land and the number of units that will be affected by a project.
- community land and assets:
  - the location of community land (e.g. common land, village greens, open green space, allotments, sports pitches etc.) and amount of land which will be required/access affected by a project;
  - the location of community assets (e.g. village halls, healthcare facilities, education facilities, religious facilities etc.) and number of assets from which land will be required/access affected by a project;
  - the level of existing accessibility restrictions/severance to community land and

assets within the study area;

- the frequency of use of community land and assets within the study area.

- development land and businesses:
  - the location and number of businesses (and associated jobs) at risk or from which land will be required/access affected by a project;
  - the location of land allocated for development by local authorities and the number of future jobs that will be affected by a project;
  - land not allocated by local authorities which is subject to planning application(s) supporting future jobs;
  - the level of existing accessibility restrictions/severance to development land and businesses within the study area.
- agricultural land holdings:
  - the type, location and number of agricultural holdings at risk of demolition or from which land will be required/access affected by a project;
  - the level of existing severance/accessibility restrictions to agricultural land holdings within the study area;
  - the frequency of use of the agricultural holdings/assets within the study area.
- WCH:
  - the type, location and extent of WCH provision (e.g. public rights of way) within the study area;
  - the frequency of use of the WCH provision within the study area

7.23 The document outlines that significance of any effect shall be derived by combining the sensitivity of receptors with the magnitude of change arising from a project.

Temporal scope

7.24 The temporal scope for the assessment has considered the length of the construction phase and will be used to consider temporary and permanent effects of the development over time. The temporal scope includes:

- Short term – Temporary effects related to a specific construction event of no more than a year's duration – such as the construction of an individual building or a specific element of infrastructure such as a section of road.
- Medium term – Temporary effects of longer duration, such as those arising over an extended period of construction ranging from one year to the full construction period, envisaged to be ten years.
- Long term – Permanent effects arising from the operation of the HNRFI or from the permanent presence or removal of physical features

Significance criteria

7.25 The assessment of effect significance would be undertaken based on the general methodology presented in this PEIR Chapter and expert judgment. The assessment would aim to be objective and to quantify effects, where possible. Where quantification is not possible, qualitative assessments will be made and justified.

7.26 To arrive at a judgement on the significance of the effect, the assessment considers the sensitivity of different receptors. The assessment of the receptors' sensitivity is based on the baseline research section below. The receptors for the 500m study area are based on the sensitivity criteria in the DMRB LA 112 Population and Health as outlined in the Legislation, Policy and Guidance section below. **Table 7.2** outlines the criteria for the sensitivity of land use receptors.

Table 7.2: Criteria for receptor sensitivity

Receptor value (sensitivity)	**Description**
Very High	Private property and housing: 1) existing private property or land allocated for housing located in a local authority area where the number of households are expected to increase by >25% by 2041 (ONS data); and/or 2) existing housing and land allocated for housing (e.g. strategic housing sites) covering >5hectare and / or >150 houses. Community land and assets where there is a combination of the following: 1) complete severance between communities and their land/assets, with little/no accessibility provision; 2) alternatives are only available outside the local planning authority area; 3) the level of use is very frequent (daily); and 4) the land and assets are used by the majority (>=50%) of the community. Development land and businesses: 1) existing employment sites (excluding agriculture) and land allocated for employment (e.g. strategic employment sites) covering >5ha. Agricultural land holdings: 1) areas of land in which the enterprise is wholly reliant on the spatial relationship of land to key agricultural infrastructure; and 2) access between land and key agricultural infrastructure is required on a

Receptor value (sensitivity)	Description
	frequent basis (daily). WCH: 1) national trails and routes likely to be used for both commuting and recreation that record frequent (daily) use. Such routes connect communities with employment land uses and other services with a direct and convenient WCH route. Little / no potential for substitution. 2) routes regularly used by vulnerable travellers such as the elderly, school children and people with disabilities, who could be disproportionately affected by small changes in the baseline due to potentially different needs. 3) rights of way for WCH crossing roads at grade with >16,000 vehicles per day.
High	Private property and housing: 1) private property or land allocated for housing located in a local planning authority area where the number of households are expected to increase by 16-25% by 2041 (ONS data); and/or 2) existing housing and land allocated for housing (e.g. strategic housing sites) covering >1-5hectare and / or >30-150 houses. Community land and assets where there is a combination of the following: 1) there is substantial severance between community and assets, with limited accessibility provision; 2) alternative facilities are only available in the wider local planning authority area; 3) the level of use is frequent (weekly); and 4) the land and assets are used by the majority (>=50%) of the community. Development land and businesses: 1) existing employment sites (excluding agriculture) and land allocated for employment (e.g. strategic employment sites) covering >1 - 5ha. Agricultural land holdings: 1) areas of land in which the enterprise is dependent on the spatial relationship of land to key agricultural infrastructure; and 2) access between land and key agricultural infrastructure is required on a frequent basis (weekly).

Receptor value (sensitivity)	Description
	WCH: 1) regional trails and routes (e.g. promoted circular walks) likely to be used for recreation and to a lesser extent commuting, that record frequent (daily) use. Limited potential for substitution; and/or 2) rights of way for WCH crossing roads at grade with >8,000 - 16,00 0 vehicles per day
Medium	Private property and housing: 1) houses or land allocated for housing located in a local authority area where the number of households are expected to increase by >6-15% by 2041 (ONS data); and/or 2) existing housing and land allocated for housing (e.g. strategic housing sites) covering <1 hectares and / or <30 houses. Community land and assets where there is a combination of the following: 1) there is severance between communities and their land/assets but with existing accessibility provision; 2) limited alternative facilities are available at a local level within adjacent communities; 3) the level of use is reasonably frequent (monthly); and 4) the land and assets are used by the majority (>=50%) of the community. Development land and businesses: 1) existing employment sites (excluding agriculture) and land allocated for employment (e.g. strategic employment sites) covering <1ha. Agricultural land holdings: 1) areas of land in which the enterprises are partially dependent on the spatial relationship of land to key agricultural infrastructure; and 2) access between land and key agricultural infrastructure is required on a reasonably frequent basis (monthly). WCH: 1) public rights of way and other routes close to communities which are used for recreational purposes (e.g. dog walking), but for which alternative routes can be taken. These routes are likely to link to a wider network of routes to provide options for longer, recreational journeys, and /or

Receptor value (sensitivity)	Description
	2) rights of way for WCH crossing roads at grade with >4000-8000 vehicles per day.
Low	Private property and housing: 1) proposed development on unallocated sites providing housing with planning permission/in the planning process. Community land and assets where there is a combination of the following: 1) limited existing severance between community and assets, with existing full Disability Discrimination Act 1995 (DDA) [Ref 2.N] compliant accessibility provision; 2) alternative facilities are available at a local level within the wider community; 3) the level of use is infrequent (monthly or less frequent); and 4) the land and assets are used by the minority (>=50%) of the community. Development land and businesses: 1) proposed development on unallocated sites providing employment with planning permission/in the planning process. Agricultural land holdings: 1) areas of land which the enterprise is not dependent on the spatial relationship of land to key agricultural infrastructure; and 2) access between land and key agricultural infrastructure is required on an infrequent basis (monthly or less frequent). WCH: 1) routes which have fallen into disuse through past severance or which are scarcely used because they do not currently offer a meaningful route for either utility or recreational purposes, and/or 2) rights of way for WCH crossing roads at grade with
Negligible	Private property and housing: 1) N/A. Community land and assets where there is a combination of the following: 1) no or limited severance or accessibility issues;

Receptor value (sensitivity)	Description
	2) alternative facilities are available within the same community; 3) the level of use is very infrequent (a few occasions yearly); and 4) the land and assets are used by the minority (>=50%) of the community. Development land and businesses: 1) N/A. Agricultural land holdings: 1) areas of land which are infrequently used on a non-commercial basis. WCH: 1) N/A.

7.27 **Table 7.3** identifies these receptors and their sensitivity based on the study areas.

Table 7.3 Receptor sensitivity

Receptor	Receptor sensitivity	Commentary
Private property and housing in the study area affected.	High	Within the study area of the Main HNRFI Site and a further 500m, there are approximately 130 homes.
Community land and assets in the study area that could be affected.	Medium	The community assets in the study area that would be affected include Burbage Common and Woods. Although, access will still be provided. There are also alternative community assets such as Aston Firs.
Development land and businesses in the study area that could be affected.	Medium	The Main HNRFI Site is not an existing or allocated employment site. There is an existing dog kennels business which will be affected and it is less than 1 hectare in size. There is also a farm shop within the Main HNRFI Site, which is assessed with the agricultural land holdings. In the surrounding study area, the baseline identifies 114 business premises. This includes the equestrian business located near the Main HNRFI Site.

Agricultural land holdings in the study area that are affected.	High	In the Main HNRFI Site, there are three agricultural holdings that will be brought under the control of the Applicant.
Walkers, cyclists and horse-riders in the immediate area that are affected.	Medium	Public rights of way and other routes which are used for recreational purposes are close to communities, but other alternative routes are available, which are longer but provide a link to the wider network.
Residents in the study area that could work on the construction project.	Low	The baseline research shows that the unemployment rate in the study area is the same as the England average.
Residents in the study area that could benefit from the employment opportunities associated with the Proposed Development.	Low	The baseline research shows that the unemployment rate in the study area is the same as the England average.
Logistics business that could benefit from the Proposed Development.	High	The baseline of the PEIR chapter identifies a need to plan for an additional 2,570,000sqm of floorspace for warehouse, to accommodate increasing demand by 2041 in Leicester and Leicestershire LEP. This includes a need for 1,106,000sqm of rail served warehouse space.
Demand for housing within the relevant Housing Market Area due to increased employment.	High	Housing affordability has been worsening, and average delivery between 2011-2017 has been lower than required.

Magnitude

7.28 The magnitude of an impact is described as Negligible, Low, Medium and High. Impacts are either positive or negative. Such terms are relative to the receptor affected by the impact. The scale of the effect is determined with reference to planning policy, best practice guidance and relevant contextual factors. For example, an employment generation of 100 new jobs could be considered a major beneficial effect in a settlement of 1,000 residents, but it would be a less significant effect in a larger settlement of 100,000 residents.

7.29 The magnitude of impacts for the receptors in the immediate area (private property and housing, community land and assets, development land and businesses, agricultural land holdings, and walkers, cyclists and horse-riders) will be determined with reference to the DMRB LA 112 *Population and Health guidance* as outlined in the Guidance section of the chapter. **Table 7.4** below outlines the criteria for the magnitude of impacts.

Table 7.4 Criteria for the magnitude of the impact

Magnitude of impact	Description
High	Private property and housing, community land and assets, development land and businesses and agricultural land holdings: 1) loss of resource and/or quality and integrity of resource; severe damage to key characteristics, features or elements. e.g. direct acquisition and demolition of buildings and direct development of land to accommodate highway assets; and/or 2) introduction (adverse) or removal (beneficial) of complete severance with no/full accessibility provision. WCH (Walkers, Cyclists and Horse-riders): >500m increase (adverse) / decrease (beneficial) in WCH journey length
Medium	Private property and housing, community land and assets, development land and businesses and agricultural land holdings: 1) partial loss of/damage to key characteristics, features or elements, e.g. partial removal or substantial amendment to access or acquisition of land compromising viability of property, businesses, community assets or agricultural holdings; and/or 2) introduction (adverse) or removal (beneficial) of severe severance with limited / moderate accessibility provision. WCH: >250m - 500m increase (adverse) or decrease (beneficial) in WCH journey length.
Low	Private property and housing, community land and assets, development land and businesses and agricultural land holdings: 1) a discernible change in attributes, quality or vulnerability; minor loss of, or alteration to, one (maybe more) key characteristics, features or elements, e.g., amendment to access or acquisition of land resulting in changes to operating conditions that do not compromise overall viability of property, businesses, community assets or agricultural holdings; and/or 2) introduction (adverse) or removal (beneficial) of severance with adequate accessibility provision. WCH: >50m - 250m increase (adverse) or decrease (beneficial) in WCH journey length.
Negligible	Private property and housing, community land and assets, development land and businesses and agricultural land holdings:

Magnitude of impact	Description
	1) very minor loss or detrimental alteration to one or more characteristics, features or elements. e.g. acquisition of non-operational land or buildings not directly affecting the viability of property, businesses, community assets or agricultural holdings; and/or 2) very minor introduction (adverse) or removal (beneficial) of severance with ample accessibility provision. WCH: <50m increase (adverse) or decrease (beneficial) in WCH journey length.
No change	No loss or alteration of characteristics, features, elements or accessibility; no observable impact in either direction.

7.30 For other impacts, standard criteria for assessing sensitivity, magnitude and significance for socio-economic resources, and the level of significance applied to an effect, have been determined using professional judgement. The assessment aims to be objective and to quantify effects, where possible. Where quantification has not been possible, qualitative assessments have been made and justified. The relative significance of an effect is largely a product of the value and sensitivity of the identified receptor and the magnitude and duration of the impact. **Table 7.5** shows how the receptors' sensitivity and the impacts' magnitude are used to estimate the significance of an effect.

Table 7.5 Matrix of significance

		Receptor Sensitivity		
		Low	**Medium**	**High**
Impact Magnitude	Negligible	Neutral	Neutral	Neutral
	Low	Minor	Minor/Moderate	Minor/Moderate
	Medium	Minor/Moderate	Moderate	Moderate/Major
	High	Moderate	Moderate/Major	Major

7.31 In terms of describing the duration of effect, short and medium term effects are those associated with the site preparation and construction phase, and long-term impacts are those associated with the completed development and its operation.

7.32 Effects that are moderate or major are considered to be significant in EIA terms.

Cumulative effects

7.33 Committed developments located in the Zone of Influence that are relevant to HNRFI are identified and assessed as per the above criteria to determine any potential cumulative effects. These are considered in accordance with PINS Advice Note 17. Further

information is provided in Chapter 20.

Assumptions

7.34 By the nature of the methodology, estimates of change in the socio-economic elements such as economic and employment effects are subject to uncertainty. The estimates in this chapter will be based on good practice, but there will likely be a degree of uncertainty around estimates. This chapter's estimated effects are likely to be in a range of +/- 20% of figures given to account for this uncertainty, as is standard practice with this type of estimates.

7.35 The current coronavirus crisis will have a major impact on the sector and society in the short to medium term. This chapter is based on an assessment against a pre-coronavirus baseline and needs to be read in that light. Therefore, the analysis and conclusions should be considered as potentially relevant to the situation once the UK has recovered from the most significant impacts of the pandemic. The economic activity of the logistics sector is associated with workforce working on site and working patterns are not anticipated to be affected in the long term.

LEGISLATION, POLICY AND GUIDANCE

7.36 There is no legislation or planning policy that directly guides the approach to assessing the social and economic effects of new development, including the effect on existing land uses.

7.37 Central Government guidance, such as the Additionality Guide (Homes and Communities Agency HCA 2014) and the Employment Density Guide (HCA, 2015) frames the economic impact assessment. The process is explained more fully in the relevant sections.

7.38 Plans and research from the LLEP are relevant considerations here, particularly in setting out how the proposals fit with plans and priorities for economic development and investment.

7.39 The research into strategic distribution developments has been undertaken at the Leicester and Leicestershire level, either directly by the Local Enterprise Partnership or by the coordinated direction of the local authorities.

7.40 The terms logistics, distribution, warehousing, and B8 (the relevant planning use class) are often used interchangeably to describe the same process in the different research reports. Here the focus is on the physical manifestation of the process – the buildings and land required to perform the logistics or distribution function. The preferred approach in this report is to use the term 'logistics' for the sector or activities, and 'distribution centre' for the premises.

National Policy Statement for National Networks (2014)

7.41 NPS, sets out the need for and the government's policies to deliver the development of NSIPs on the national road and rail networks in England and Wales. The overall goal is to support a competitive economy and thereby improve the overall quality of life of residents.

7.42 To ensure England's national networks support the Government's larger goal of supporting a prosperous and competitive economy, this means supporting:

- Networks with the capacity, connectivity and resilience to support national and local economic activity and facilitate growth and create jobs;
- Networks which support and improve journey quality, reliability and safety;
- Networks which support the delivery of environmental goals and the move to a low carbon economy; and
- Networks which join up our communities and link effectivity to each other.[1]

7.43 It provides planning guidance for promoters of NSIPs on the road and rail networks, and the basis for the examination by the Examining Authority and decisions by the Secretary of State. NPS states that the sustainable development of national road and rail networks should minimise social and environmental impacts and improve quality of life. However, due to the nature of these developments, some adverse effects are also anticipated. Mitigation of these effects should be in line with the principles of NPPF and the Government's planning guidance.

7.44 The NPS reiterates the importance of strategic rail freight interchanges. It highlights that the logistics sector employs over 2 million people, generating £90 billion, and underpins the efficient operation of most of the economy[2]. Rail freight interchanges are crucial as they allow freight to be transferred between transport modes, allowing rail to be used to undertake the long-haul primary trunk journey, with other means providing the final leg of the journey. Therefore, SRFIs play an important role in reducing the cost of moving freight by reducing trip mileage, as well as reducing congestion on national and local road networks.

7.45 There is a growing need for SRFIs, as many existing rail freight interchanges sit in urban areas where there is limited room to expand, and therefore limiting the ability to update to modern warehousing that is needed to aid the transfer of freight from road to rail, supporting sustainable distribution and meeting the changing needs of the logistics sector[3].

7.46 There is also a growing demand for SRFIs, as the expansion at Felixstowe North Terminal and construction of London Gateway will lead to a significant increase in rail-based logistics operations. Thus, there will be a need to reduce dependence on road haulage to

[1] Department for Transport, 2014. National Policy Statement for National Networks, Page 9
[2] Department for Transport, 2014. National Policy Statement for National Networks, par 2.42
[3] Department for Transport, 2014. National Policy Statement for National Networks, par 2.47

serve major markets. Network Rail's unconstrained rail freight forecasts, considered robust by the government, indicate that there is a clear need for rail freight interchanges to accommodate long-term growth, and also serve a dual purpose of attracting substantial business where new SRFI facilities are present[4].

7.47 Because many of the on-site processes are labour-intensive, an SRFI can create many new job opportunities and contribute to the enhancement of people's skills and use of technology. Thus, the availability of a workforce is also an important consideration.

National Planning Policy Framework (2021)

7.48 The 2021 NPPF supports plan-making to create the conditions for economic growth and inward investment, with specific reference to planning for storage and distribution operations. Paragraph 81 states that:

'Planning policies and decisions should help create the conditions in which businesses can invest, expand and adapt. Significant weight should be placed on the need to support economic growth and productivity, taking into account both local business needs and wider opportunities for development.'

7.49 Paragraph 83 states that:

'Planning policies and decisions should recognise and address the specific locational requirements of different sectors. This includes making provision for clusters or networks of knowledge and data-driven, creative or high technology industries; and for storage and distribution operations at a variety of scales and in suitably accessible locations.'

Leicester and Leicestershire Enterprise Partnership and Local Authorities Policy

Strategic Economic Plan 2014 to 2020 (2014)

7.50 The SEP identifies the following relevant issues as major risks to the Leicester and Leicestershire economy:

- Lack of suitable employment land for 'our most land intensive priority sectors (logistics and manufacturing)' page 5
- Inadequate transport infrastructure causing congestion and resulting in increased business costs.

7.51 **Figure 7.5** shows the growth areas identified in the SEP for prioritised investment.

[4] Department for Transport, 2014. National Policy Statement for National Networks, par 2.49

Figure 7.5: Growth areas in Leicester and Leicestershire LEP

Source: Leicester and Leicestershire Strategic Economic Plan 2014 to 2020 (2014), p6

7.52 The SEP identifies a higher than average concentration of employment and competitive advantage in the logistics sector, where the action is to focus on continued business development and support.

7.53 The East Midlands Gateway Strategic Rail Freight Interchange is identified as one of four 'transformational priorities'.

7.54 The A5 Corridor within the South West Growth Area is identified as playing a 'pivotal role' in supporting ambitions for the logistics sector by servicing sites within the LLEP area. The

SEP acknowledges that freight connectivity will be substantially enhanced by the upgrade of the Felixstowe to Nuneaton (F2N) freight railway line which will significantly increase freight capacity through accommodating longer trains up to 750m and larger shipping containers. This route passes through the Growth Area and would serve the HNRFI.

7.55 Strategic housing developments at New Lubbesthorpe, Earl Shilton and Barwell are reported to deliver nearly 9,000 new homes to the South West Growth Area, creating demand for employment.

LLEP Strategic Growth Plan (SGP) - 2018

7.56 The Strategic Growth Plan (SGP) is produced by the Leicester and Leicestershire Enterprise Partnership (LLEP). The LLEP covers the City of Leicester and the County of Leicestershire, which includes the districts of North-West Leicestershire, Hinckley and Bosworth, Blaby, Harborough, Oadby and Wigston, Melton, and Charnwood. The SGP puts forward proposals for future development that will be needed to support population change and economic growth until 2050. It sets an employment land need for the period 2011-2031 of between 367hectares and 423hectares. These estimates are based on the 2017 HEDNA, summarised further below in this chapter.

7.57 A key investment priority of the plan is the A5 improvement corridor. The A5 is a long-distance strategic route running from the south-east to the north-west regions, acting as an alternative to the M6. However, the route has been suffering from increasing congestion. Investing in the improvement of A5 will also support growth in advanced manufacturing and logistics developments in the area, as well as housing delivery. The proposed HNRFI is located in the growth corridor of the A5 improvement and fits within the SGP's ambition to shift growth to major strategic locations and to support logistics developments.

7.58 The document also sets out four priorities (page 17) to guide growth in the region:

- balancing the need for new housing and jobs with the protection of our environment and built heritage;
- focusing more development in strategic locations and less on non-strategic sites;
- securing essential infrastructure to support growth;
- maintaining the essential qualities of Leicester and Leicestershire and delivering high-quality development.

7.59 The HNRFI aligns with the above priorities by proposing sustainable development in a strategic location adjacent to the M69 and securing road access directly from Junction 2 of the M69 by adding a southbound slip road to Junction 2 of the M69. This junction currently only caters for motorway traffic heading to and from the north.

Warehousing and Logistics in Leicester and Leicestershire: Managing growth and change (WLLL) (2021)

7.60 This report about the strategic warehousing and logistics sector in the county was jointly commissioned by the Leicester & Leicestershire authorities and the Leicester and Leicestershire Enterprise Partnership. It assesses the current and future needs of the logistics sector and forecasts future floorspace and land needs by 2041. The study identified the main drivers for change in the logistics sector. These are listed below:

7.61

- Increasing growth of e-commerce with a transactions forecast to account for 65% of the total retail transactions by 2050.
- Increasing automation in warehouses and increasing productivity.
- Decarbonisation of logistics through a switch to rail fright where possible and electric light goods vehicles.
- Increase of rail freight tonnage due to increasing road haulage cost, the development of SRFIs in the Midlands and the north of England and a growing proportion of imports arriving in maritime containers.

7.62 The study identifies a future warehouse supply of 1,781,000sqm across Leicestershire. This is equivalent to around 6.9 years of take-up based on a past annual average and it is considered not sufficient to cater for the period to 2041.

7.63 The study develops a number of scenarios to forecast floorspace demand. These take into account need to replace the existing stock and traffic growth and recommends the high replacement demand, higher sensitivity traffic growth for planning policy development. This forecasts a need for 2,751,000sqm of warehouse floorspace by 2041. The floorspace need comprises 1,106,000sqm rail-served and 1,466,000sqm road-served floorspace.

7.64 The above forecast suggests that there is still a demand for a SRFI in Leicestershire in addition to the East Midlands Gateway and East Midlands Distribution Centre SRFI schemes .

Local planning policy

Blaby District Core Strategy (2013)

7.65 Blaby District adopted its Core Strategy in February 2013. The key policies for the PEIR chapter are summarised below with Chapter 5 providing a full summary of the core strategy. The site is identified as countryside and covered by Policy CS18. The policy prevents built development with significant adverse effects on the character of the landscape but recognises the need for a balanced approach with the need to provide new development in sustainable locations.

7.66 Policy CS6 focuses on employment and the need for a range of employment opportunities to meet the needs of its residents and wider communities, allowing for growth of existing businesses and for inward investment particularly in the 'priority' employment sectors.

The policy provision is not addressing NSIPs, which serve a national need and can provide a substantial source of employment.

The Fosse Villages Neighbourhood Plan (2021)

7.67 The Neighbourhood Plan was adopted in June 2021 but a referendum on the plan has yet to be held during Covid 19 restrictions. The Neighbourhood Plan acknowledges the proposals for a 'rail freight hub' (paragraph 50).

CONSULTATION

7.68 The scope of this assessment was submitted to the Planning Inspectorate with an application for an EIA Scoping Opinion. Comments were received through the Scoping Opinion, and these have been taken into account in the undertaking of this assessment – see Scoping Opinion section above.

7.69 The Applicant undertook two rounds of informal consultation the first in 2018 and the second in 2019. The main feedback relevant to this chapter is summarised below.

2018 consultation

7.70 The first informal consultation focused on the local community and received 514 responses. The main feedback relevant for this chapter is presented below. In terms of the location, 96 people considered the location of the proposed development to be good, whereas 242 did not agree with farmland being used for the Proposed Development. Participants raised concerns about pollution in 114 responses. In terms of the proposed economic activity 60 responded positively whereas 122 participants commented that existing RFI infrastructure is sufficient. In addition 102 responses raised concerns about the impact of the Proposed Development on the local economy.

2019 consultation

7.71 The second consultation focused on highways. Of the 544 responses received in the 2018 consultation 11% did not agree with farmland being used for the Proposed Development and 8% raised concerns about pollution caused by the proposed development.

BASELINE ASSESSMENT

The Size of the labour market

7.72 The size of the labour market sets the context for assessing the potential effects of the new jobs that would be created at the Proposed Development.

7.73 **Table 7.6** shows that there are 1,036,900 people in the study area aged between 16-64,

of which 79.7% are economically active. This is marginally higher than the English average of 79.4%. Employment in the study area in the Study Area is 76.5%, which is higher than the English average of 76.0%. Unemployment in the Study Area sits below the English average of 4.4% at 4%. This includes those residents who are not claiming unemployment benefits but are still seeking work.

7.74 Approximately 8.9% of UK workers in employment are underemployed, which the ONS defines as employed people who are available to start working longer hours within two weeks, and actual weekly hours worked were 40 or less for people aged under 18 or 48 hours or less for people aged 18 and over.

Table 7.6 Labour market within Study Area and England

Area	All Persons (16-64)	Active: Part Time	Active: Full Time	Active: Self-Employment	Active: Unemployed
Study Area	1,036,900	24.8%	75.1%	12.0%	4.0%
England	34,894,600	24.1%	75.8%	14.8%	4.4%

Source: Annual Population Survey, 2020

7.75 It is relevant also to look at the level of youth unemployment to evaluate the impact HNRFI would have on youth unemployment. The ONS defines young people as those between the ages of between 16 and 24 years old. **Table 7.7.**

Table 7.7 Labour market within Study Area and England

Area	Unemployment Persons: 16 - 24	Unemployment Rate: 16 - 24
Study Area	11,200	10.1%
England	479,500	13.7%

Source: Annual Population Survey, 2021

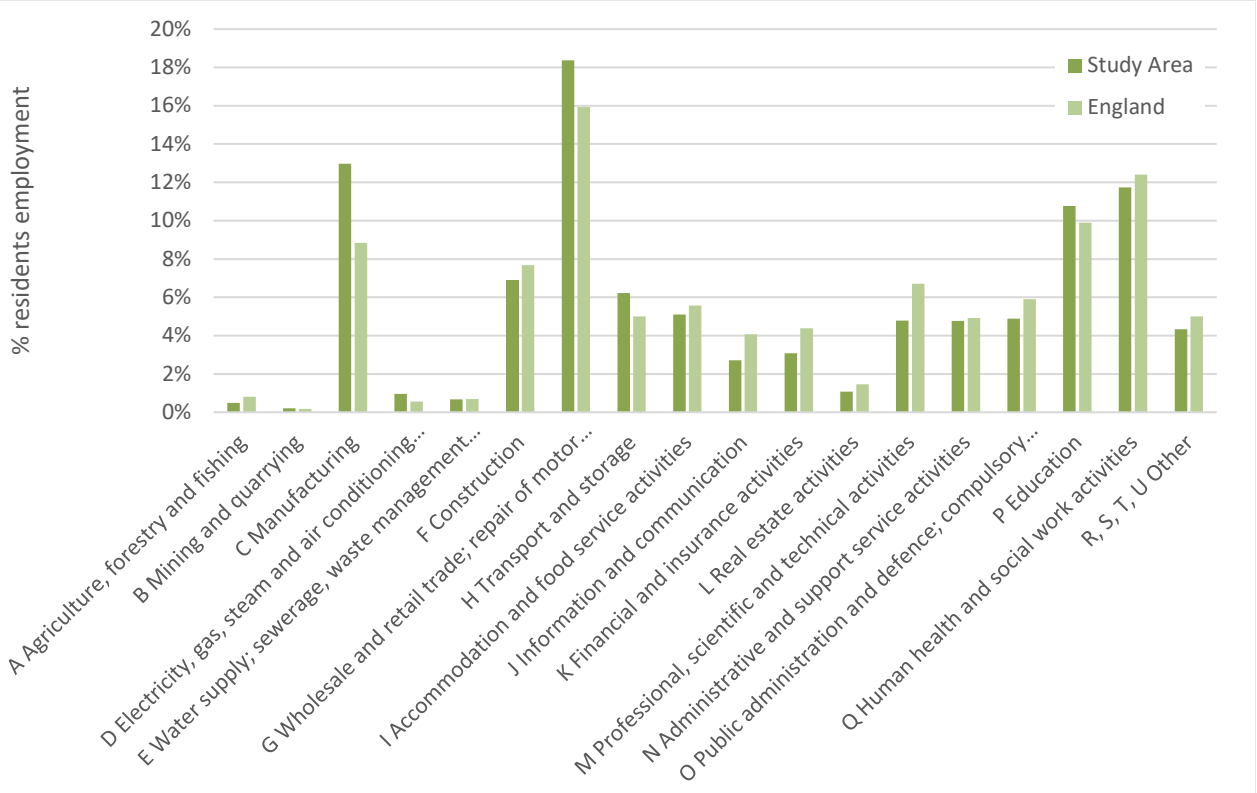
7.76 The Study Area performs considerably better in lower youth unemployment amongst 16-24 year olds. The unemployment rate for 16-24 year olds in the Study Area is 10.1%, compared to 13.7% at the English level respectively.

Construction

Construction employment

7.77 The proportion of those employed in the construction in the study area in 2011 was slightly lower than the national average (**Figure 7.6)**

Figure 7.6: Employment by sector for residents of the Study Area and England, 2011 (%)



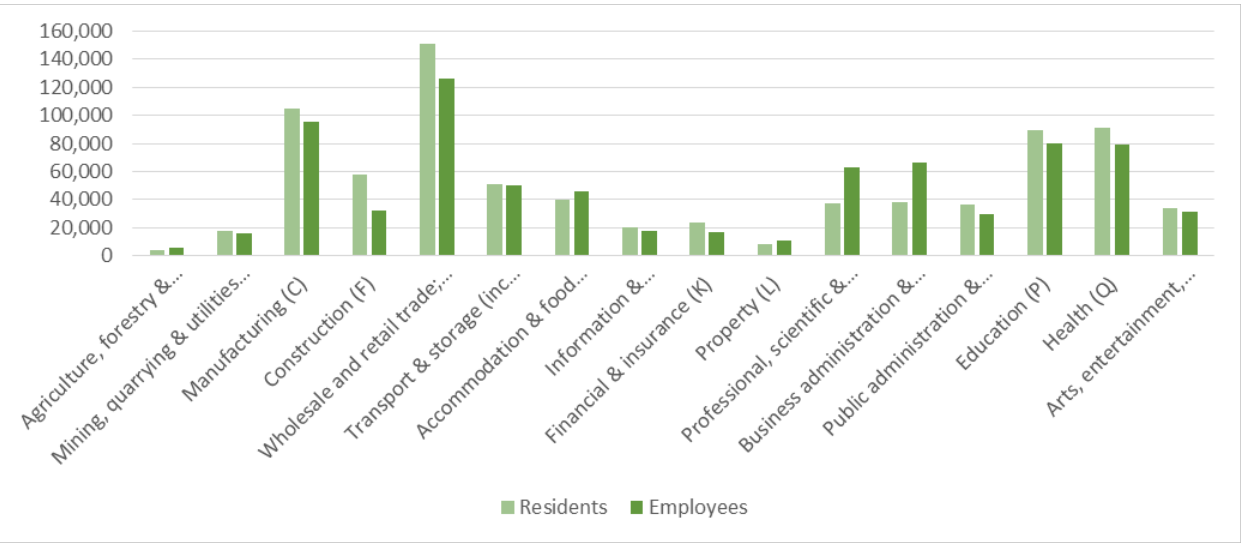
Source: Census, 2011

7.78 **Figure 7.7** compares the number of jobs by sector for residents in the study area with employees. Data on employees are sourced from the Business Register and Employment Survey (2019) so an adjustment is made to the 2011 Census data of residents working in each sector to update them to 2019 based on increases in economic activity since 2011 (an average of 0.7% p.a.; Labour Force Survey). A limitation of this approach is that it does not account for differences in employment growth/decline within the different sectors 2011-2019.

7.79 Overall the number of residents in employment in the study area is higher than the number of jobs (+0.55%). **Figure 7.7** shows that the professional, scientific and technical activities sector and administrative and support sector appear to import workers, whereas the construction sector seems to export jobs. There are estimated to be 58,000 residents employed in the construction sector in 2019.

7.80 This section shows that the construction sector has a lower concentration of jobs in the study area in comparison with England. The comparison of the number of residents working in the construction sector and the number of jobs in the same sector for the study area show a net export of jobs.

Figure 7.7: Estimated employment for residents and employees based in Study Area, 2019 (no.)



Source: Census, 2011 updated with Labour Force Survey, 2019; Business Register and Employment Survey; 2019

Construction unemployment

7.81 According to the Jobseekers' Allowance data (March 2021) published by the ONS, there are 3,615 individuals claiming JSA in the study area who usually work as labourers in building and woodworking trades, and in other construction trades. A degree of unemployment is expected to enable the job market to function, enabling workers to search or transition between roles.

Construction Skills Network, Industry Insights: Labour Market Intelligence, UK 2019-2023 Midlands (Construction Industrial Training Board)

7.82 The Construction Industrial Training Board forecasts that the East Midlands regions overall construction output will increase at an average of 1.2% p.a. 2019-2023, which does not compare favourably to the average of 1.3% p.a. at the UK level. However, East Midlands is expected to see the highest growth rate in commercial construction output across 2019 to 2023, with average annual output forecasted at 2.3% per annum, compared to the UK average of 1.3%. Subsequently, 19,100 new workers will be required between 2019-2023.[5]

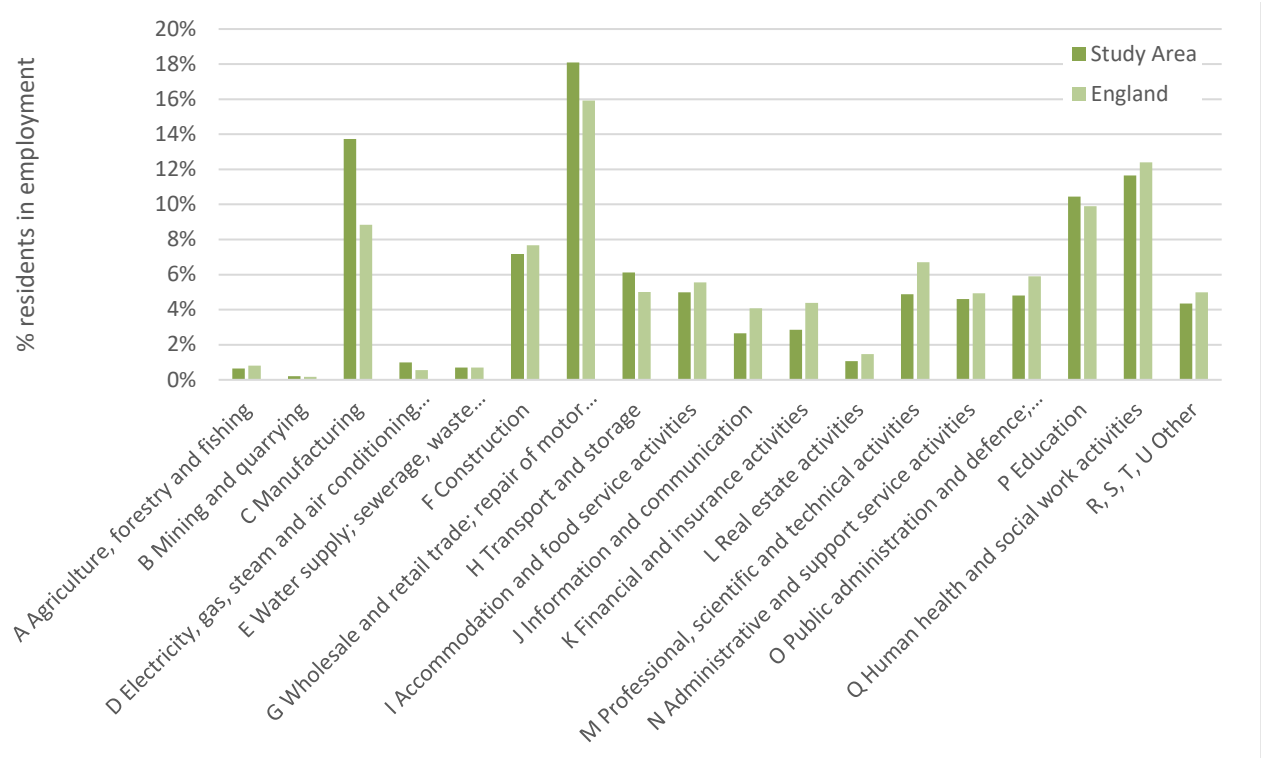
Logistics sector employment

7.83 **Figure 7.8** shows a higher proportion of residents employed in the wholesale and retail trade, and transportation and storage sectors compared to the national average. This reflects the higher proportion of opportunities in these sectors, in what is the prime

[5] Construction Industrial Training Board, Construction Skills Network, Industry Insights: Labour Market Intelligence, UK 2019-2023, page 28

location for national logistics operations, consistent with the findings of the WLLL (2021) report.

Figure 7.8: Employment by sector for residents of the Study Area and England, 2011 (%)



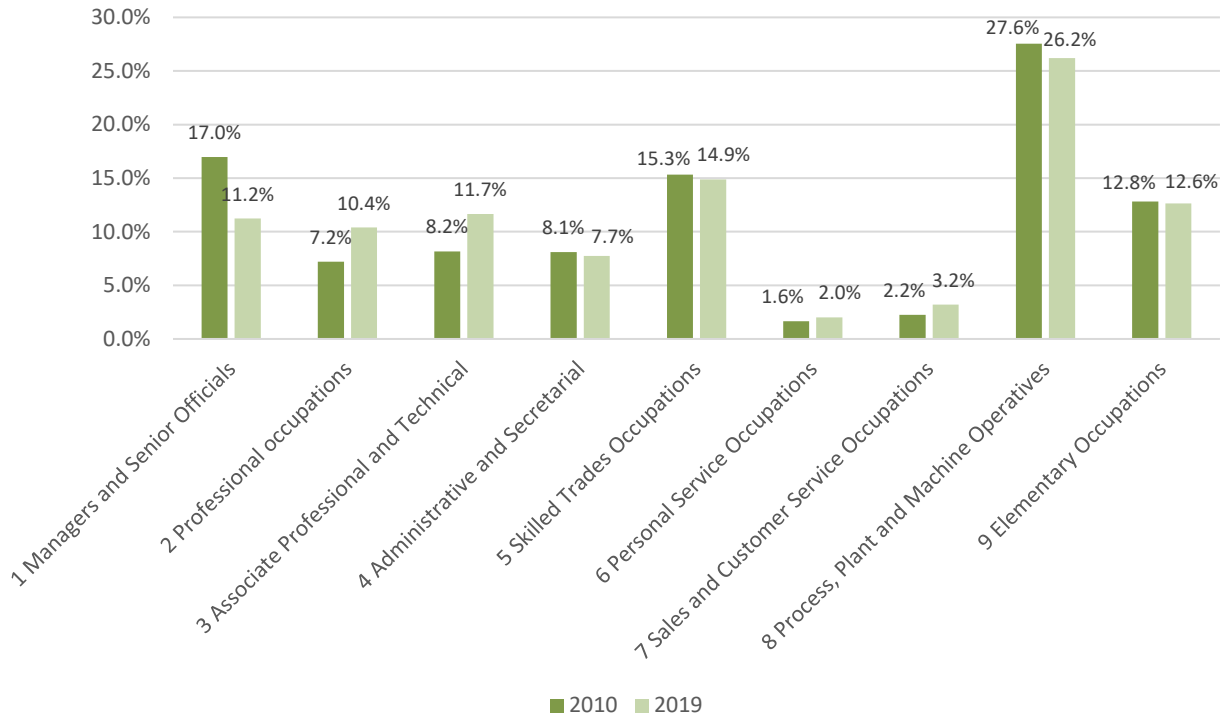
Source: Census, 2011

Occupations in the logistics sector

7.84 The past decade has seen the Industrial and Logistics (I&L) sector undergo a remarkable transformation, reshaping operating models, and occupier requirements.

7.85 New technologies have affected the sector significantly, changing the way tasks are performed and how businesses operate. Technology is replacing the most routine jobs through automation and self-driving vehicles, whilst accelerating the shift towards a higher-skilled labour force in the sector, creating new roles and inducing an occupational shift.

Figure 7.9: Occupational distribution in manufacturing and transport and storage



Source: ONS APS, Savills 2020

7.86 **Figure 7.9** above shows the change in the share of occupations in I&L in 2010 and 2019. While at the beginning of the decade there is a more polarised distribution, with a higher share of managers at one end of the spectrum and more routine occupations at the other end, there is now a higher share of Professional and Associate Professional and Technical roles, which can be both associated with high-skilled engineering and technological professions. Similarly, there is a slightly lower share of more routine occupations such as Process, Plant, and Machine Operatives.

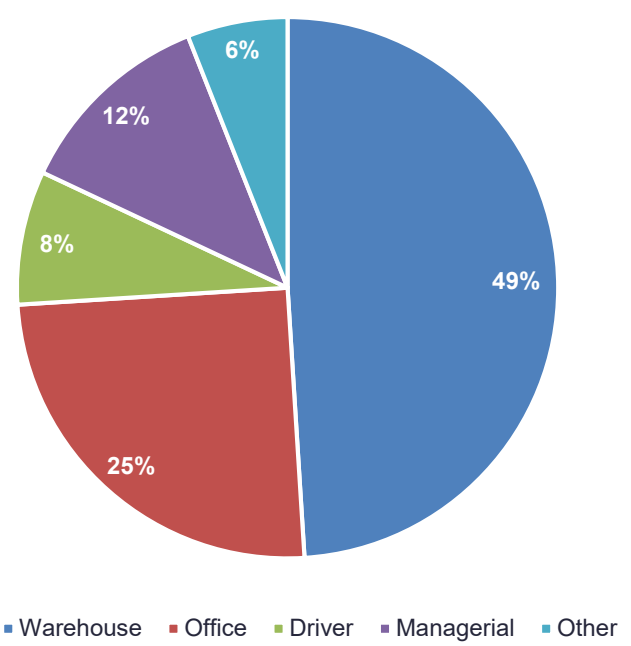
7.87 This implies a shift to higher-wage employment opportunities, as engineers, programmers and data analysts become more crucial.

7.88 In the manufacturing sector, the shift to high-value manufacturing has accentuated the changes in labour composition, marked by a rise in 'white-collar' office-based jobs. This has been driven by an increasing focus on knowledge-based aspects of the sector, such as product and process design, software development, branding, marketing, and research. These activities contribute to the development of innovative, higher quality and more sophisticated products and production processes, to ensure they remain competitive in global markets.

7.89 Whilst the largest proportion of logistics roles are still in warehouse related jobs, the sector is more diverse than is commonly thought. Research on employment in UK warehouses has shown that office and managerial jobs have doubled between 2006 and

2018, and account now for 37% of the sector's employment (**Figure 7.10**).

Figure 7.10 Share of Logistics Jobs (2018)



Source: Prologis 'Delivering the future: the changing nature of employment in distribution warehouses'. 2019

Other research

Logistics and Distribution Sector Growth Action Plan (LLEP, 2015)

7.90 The LLEP Business Survey 2015[6] found that just under 40% of logistics companies had undertaken recruitment activity in the past 12 months, with 18% reporting difficulties in filling vacancies. These issues are concentrated on two job roles – vehicle drivers accounting for 73% of all hard-to-fill vacancies and warehouse operatives a further 15%. This is consistent with the unemployed data, with negligible numbers seeking HGV roles.

Logistics UK Survey (Logistics UK, 2021)

7.91 Logistics UK's Logistics Performance Tracker (LPT) offers a snapshot of the industry at the national level with the most recent undertaken in March 2021[7]. This shows that circa two thirds of the responding logistic companies face recruitment difficulties with HGV driver and mechanics roles. The number of HGV drivers claiming Jobseekers' Allowance in January 2021 reduced by 18% since the previous year. The number of online job adverts

[6] *As reported in the Logistics and Distribution Sector Growth Action Plan, 2015*

[7] https://logistics.org.uk/logistics-magazine-portal/logistics-magazine-features-listing/auto-restrict-folder/08-04-21/logistics-performance-tracker-takes-the-industry-s

in the transport, logistics and warehouse sectors shows a 60% above the same period last year, compared to a 2% uplift in job adverts across all sectors.

Housing and Economic Demand Needs Assessment (LLEP, 2017)

7.92 Forecasts for employment growth are published at the LEP level. The study area falls relatively evenly across both part of the Leicester and Leicestershire LEP area and part of the Coventry and Warwickshire LEP area.

7.93 The LLEP HEDNA forecasts that employment will increase in the 'transportation and storage' sector by 21.9%, 2011-2036 (+6,800 jobs across the LLEP area). Employment in the 'wholesale' sector is forecasted to decrease by -2.3% over the same period (-600 jobs across the LLEP area). The Employment Land Use Study for Coventry and Warwickshire LEP (2015) forecasts there to be an additional 8,000 jobs in the logistics sector, 2011-2031 (+27.9% growth).

Wages

7.94 Wage statistics provide context for the potential economic benefits of the new jobs that will be created, and therefore an increase in the study area.

7.95 Wages vary between location and type of work undertaken. The data given in this section are for the median gross annual pay of full-time residents. It is not possible to collate a wage for the study area, thus the assessment has focused on the wages of the local authority area of Blaby, the regions of East and West Midlands, and considers the English average.

7.96 **Table 7.8** below outlines the figures to the median gross annual pay based on residents and workplace.

7.97 Residents' pay in Blaby is higher than that of the East Midlands, West Midlands and England average. All spatial scales have seen increases in their wages since 2008, with Blaby seeing an annual increase of 2.54%, compared to 1.81%, 1.79%, and 1.83% in the East Midlands, West Midlands, and in England. Therefore, wage growth has been higher in Blaby, with regional and national wage growth being slower.

7.98 Workers' wages in Blaby are higher than the East and West Midland and marginally lower than that of England. Wages of workers across all spatial scales have increased, with Blaby seeing an average annual increase in wages of 1.67% since 2008. This is the lowest annual growth of the spatial scales assessed, with wages growing at 1.86%, 1.82% and 1.84% for East Midlands, West Midlands, and England respectively. The East Midlands region's annual wage growth exceeds the English average.

Table 7.8: Median gross annual pay 2020

Area	Resident-based median gross annual pay (full time)	Workplace-based median gross annual pay (full time)
Blaby	£35,234	£31,200
East Midlands	£29,417	£29,043
West Midlands	£29,485	£29,628
England	£31,780	£31,791

Source: Annual Survey of Hours and Earnings (2020)

GVA

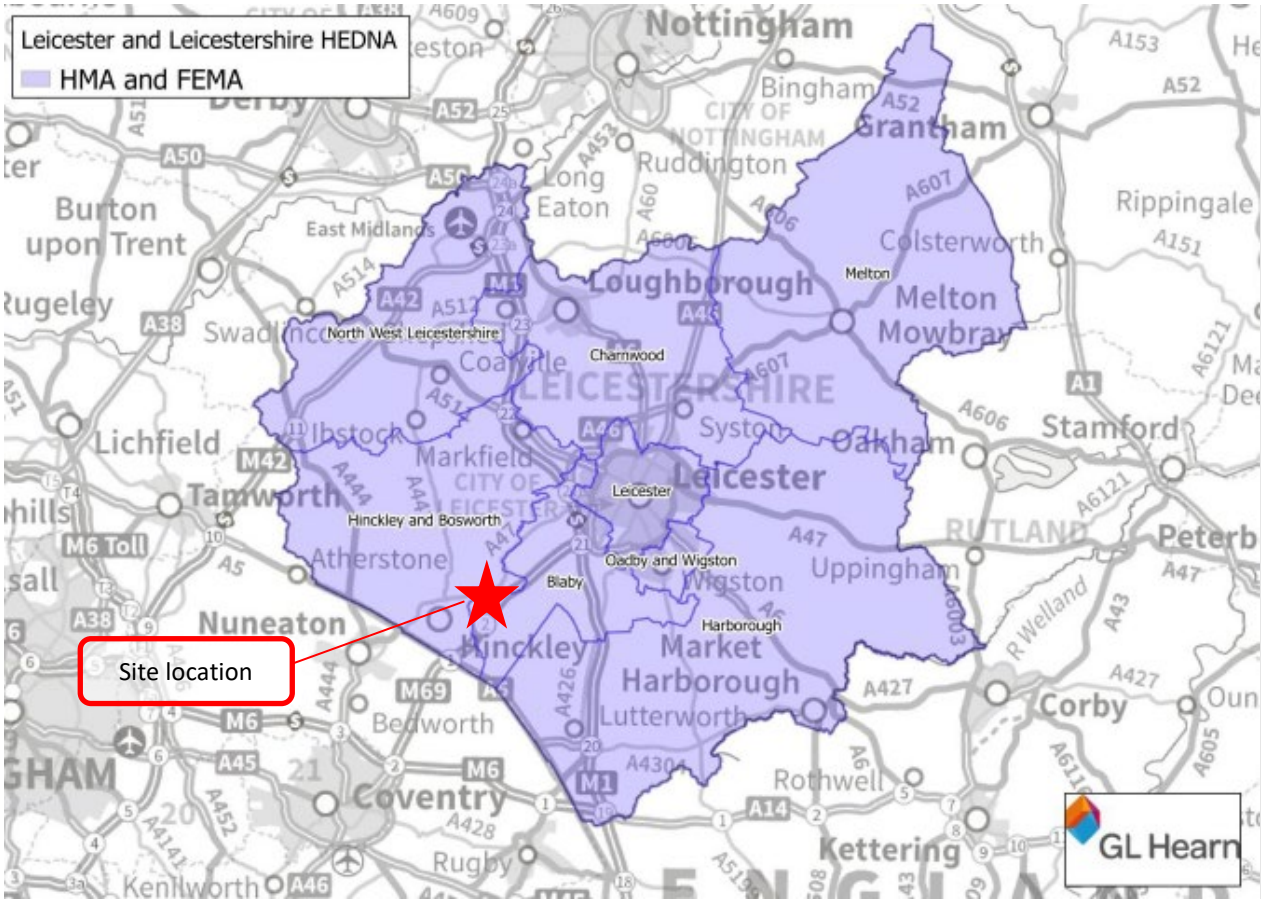
7.99 At the Local Enterprise Partnership Level, the ONS reports GVA for each industry. As there is no 'logistics industry', the relevant industries considered are 'wholesale and retail trade; transportation and storage; and accommodation and food services'. This group had a GVA for the LLEP economy of £4.7 billion in 2016, which is the largest contributor to the LLEP's economy at 19.7% of the total economy (£23.5 billion). GVA in this group has grown by an average of 3.3% per annum since 2009, slightly higher than the average across all sectors of 3.2% per annum.

Housing

LLEP Housing and Economic Development Needs Assessment (2017)

7.100 The HEDNA provides an integrated assessment of future housing needs, the scale of future economic growth and the quantity of land and floorspace required for industrial and storage and distribution (B-class) employment development across Leicester and Leicestershire. The report defines Leicester and Leicestershire as the relevant HMA and Functional Economic Market Area (FEMA). **Figure 7.11** is reproduced from the report with the Main HNRFI Site's location.

Figure 7.11: Location of the HNRFI in the Leicester and Leicestershire Housing Market Area and Functional Economic Market Area



Source: Housing and Economic Development Needs Assessment (GL Hearn, 2017), p6

7.101 The HEDNA recognises that the economic geography can vary for different sectors. In particular for the logistics sector, of which the economic geography forms part of a wider Midlands market area, with a particular concentration of activity with the 'Golden Triangle'. This is formed broadly by the M42, M1 and M6 motorways. This location is central for the country and attractive to national distribution centres.

7.102 The HEDNA acknowledges this relationship between the Leicester and Leicestershire HMA, FEMA and the draw to the south-west, towards the northern parts of Warwickshire within the Golden Triangle.

7.103 The HEDNA provides an assessment of housing need across the HMA and disaggregates this to each local authority. Blaby District Council (BDC) has a housing need of 361 additional dwellings per annum 2011-2036. The need for the HMA is 4,716 additional dwellings per annum over the same period. Projections of housing need are based on:

- the last 10 years' migration trends;
- market signals and affordable housing needs;

- adjustments to support economic growth projections.

7.104 The evidence indicates under both the Baseline and Planned Growth Scenarios, developed by the study sufficient workforce growth can be expected to support the economy at the HMA level, and therefore no upward adjustment to support economic growth is warranted.

7.105 The Planned Growth Scenario builds in planned and committed investments by developers and companies into the Baseline Scenario. Only those developments which have planning permission, have funding in place and have a reasonable likelihood of delivery and occupation are included.

7.106 In BDC further development at Castle-Acres (expansion of retail), Optimus Point (new distribution site), and Lubbesthorpe (new 21 hectares employment site) was accounted for. These were considered to increase logistics and wholesale employment but also affect retail growth and the food manufacturing and office occupying sectors. Due to the timing of the research, the HNRFI was not accounted for in the Planned Growth Scenario.

7.107 It should be noted that under the changes to the housing delivery test in early 2021, Leicester City is expected to deliver 116% of its previous delivery numbers, which equates to 18,000 additional homes over the plan period. Subsequently, surrounding local authorities such as BDC will have to increase their housing delivery to support Leicester City[8]. However, this change is yet to be adopted by local government.

7.108 The HEDNA reports strong market demand for additional logistics and distribution floorspace and acknowledges that forecasting the amount and location of 'strategic' distribution development (units over 9,300sqm) is challenging, given the sub-regional nature of the market. The HEDNA reviews the demand projections in the 2014 Leicester and Leicestershire Strategic Distribution Sector Study (SDSS) and considers these reasonable.

7.109 The smallest distribution unit at the HNRFI would be considered 'strategic' under the SDSS as it is likely to be larger than 9,300sqm Housing need related to strategic distribution development is distributed based on the forecasts for warehouse and logistics employment. The forecast has been cross-checked with the 2014 Leicester and Leicestershire Strategic Distribution Sector Study floorspace projections for consistency.

7.110 That study projects a need for an additional 244,000sqm of floorspace for strategic distribution development and estimates this would create an additional 3,050 direct jobs. (The study also identifies a need for 1,643,000sqm of new build strategic distribution premises but these would replace existing premises). There is projected to be an additional 6,800 jobs across the FEMA in the transport and storage sector 2011-2036 (Table 22). Therefore the balance of this job growth would likely be in smaller distribution units (under 9,300sqm).

[8] Inside Housing, 2021. Councils hit out at government's 'unrealistic' new planning formula.

7.111 The HEDNA acknowledges that once policy decisions have been made regarding the location of future strategic distribution development, it may be necessary to 'iterate' the conclusions on housing need to ensure alignment between homes and jobs. This is likely to be required; the HEDNA forecasts an increase of +100 jobs in BDC 2011-2036. This is the lowest employment growth of any of the Councils in the LLEP area. The proportion of jobs growth for BDC would likely need to be increased, with a re-allocation from other Councils (although the +100 jobs for BDC is a net forecast and may account for growth in the logistics sector offsetting decline in other sectors). It is expected that re-iteration would be taken forward through joint working between the local authorities through the Duty to Cooperate.

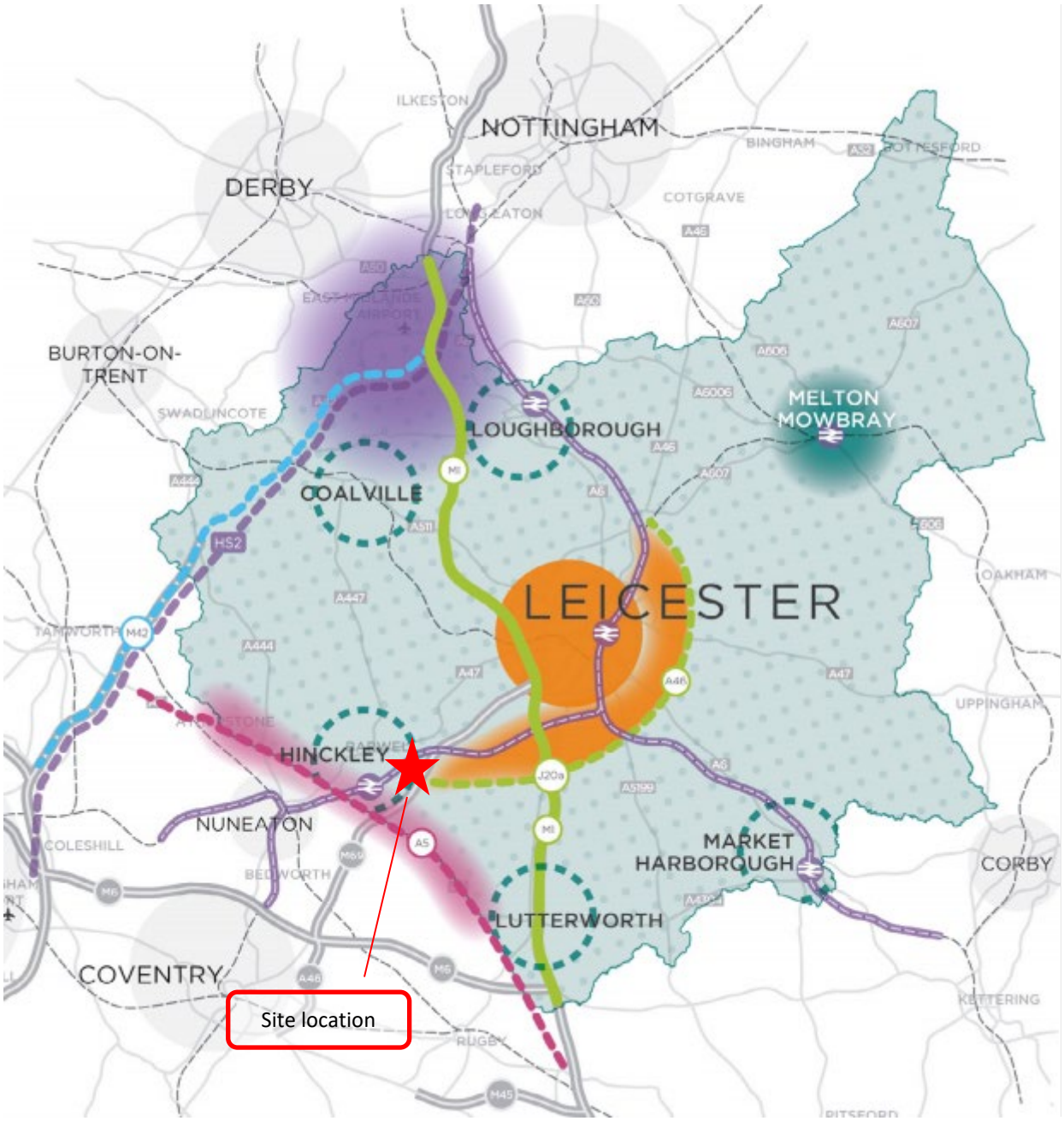
7.112 Although there are concerns surrounding affordability and affordable housing, the report shows that there is a gross need of 140,218 affordable housing units in the HMA between 2011-2036. When considering the supply from existing stock, there is a net need of 55,947.

Leicester and Leicestershire 2050: Our Vision for Growth (2019)

7.113 This document was prepared by LLEP and its ten local authorities to provide a long term vision to address the challenges and opportunities that Leicester and Leicestershire face. The Vision considers one of the strengths of the region to be its location and connectivity. Relevant weaknesses are listed as congestion on the roads and railways, poor economic productivity per head of population, low pay structure and high levels of commuting.

7.114 The Vision identifies a key issue as pressure from development on small and medium-sized sites and proposes to focus development on more strategic locations. The primary growth areas are identified as Leicestershire International Gateway and A5 Improvement Corridor, see **Figure 7.12**.

Figure 7.12: HNRFI location in relation to the Leicester and Leicestershire Strategy Plan



Source: Leicester and Leicestershire 2050: Our Vision for Growth, p22

7.115 Both growth areas are situated close to the Main HNRFI Site location. The Main HNRFI Site location next to M69 and its rail connection connects it with ports, airports and motorways, allowing access to the major UK and international markets. The improvement of the A5 will also ease congestion in the area and increase capacity for future advanced manufacturing and logistics developments. This will be beneficial in supporting the success of the HNRFI. The improvement corridor will also deliver already planned housing growth, which will provide a nearby labour market for HNRFI.

Local Industrial Strategy Economic Review, 2020

7.116 The report, prepared by Oxford Economics on behalf of LLEP sets out the evidence base that will underpin the Leicester and Leicestershire LEP Local Industrial Strategy, a final version of which is yet to be published.

7.117 It highlights the HEDNA's estimates of an additional 4,716 dwellings per annum is required between 2011-2036. It also notes that the average delivery between 2011-2017 was 4,017 dwellings per annum.

7.118 At the LLEP level, demand has outstripped supply, directly impacting the affordability of housing across the LLEP. Between 2009-2019, house prices on average had grown by 29 per cent. It is expected house prices will grow by an annualised growth rate of three per cent per year up to 2030.

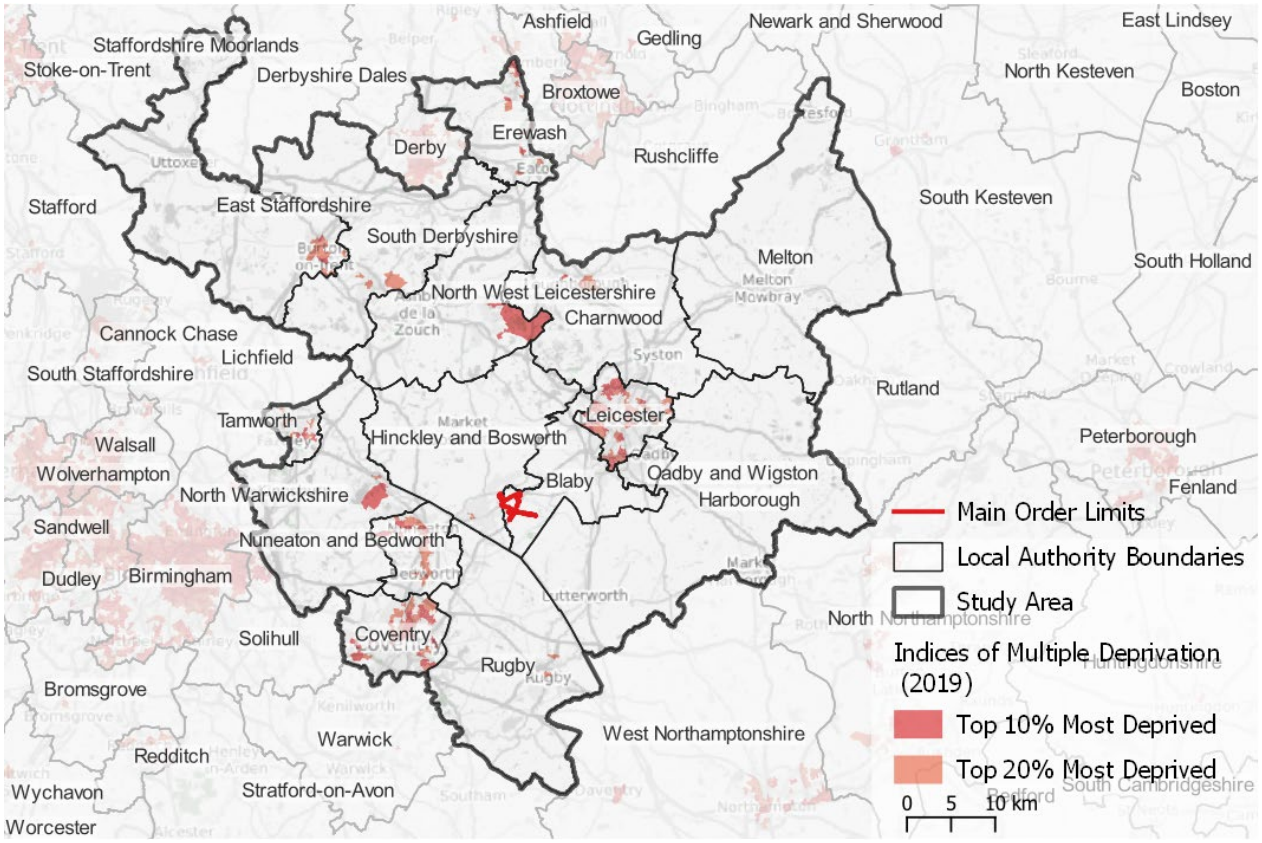
Deprivation

7.119 Since the 1970s the UK government has recorded local measures of deprivation in England. It is an official measure of relative deprivation and is based on distinct domains including income, employment, health and disability, education, skills and training, crime, barriers to housing and services, and the living environment[9].

7.120 **Figure 7.13** shows the 10% and 20% most deprived Lower Super Output Areas (LSOA) in the country. It illustrates that the immediate area surrounding the Main HNRFI Site does not have large concentrations of deprivation, except the south-west of Hinckley. Neighbouring Nuneaton and Bedworth have a concentration of communities in the top 10% and 20% most deprived, as do Coventry and Leicester, further afield.

[9] Main Statistical Finings Indices of Deprivation 2019, MHCLG (2019)

Figure 7.13 Indices of multiple deprivation in the Study Area



Source: Savills (2021)

Land use

Project boundary

7.121 The Main HNRFI Site is predominantly landowner farmed with three landowners operating the majority (97%) of the agricultural land. The balance of land (3%) comprises grazing land, a boarding kennel, private residential property and an area in equestrian use.

7.122 Baseline information was collected via questionnaires and telephone interview with land agents and/or agricultural users. Responses were received from the three main landowners and one smaller landowner; these operate 97% of the agricultural land within the Main HNRFI Site . The survey found that agricultural land within the Main HNRFI Site is landowner operated with no tenancy agreements in place on any of the land.

7.123 Landowner 1 has a total farm holding of 95.5 hectares, of which 36.1 hectares is affected by the Proposed Development. The land is in arable use and the farm business employs three people.

7.124 Landowner 2 has 28.8 hectares of land affected by the Proposed Development. The land is used to support livestock and one person is employed by the business.

7.125 Landowner 3 has a total land holding of 115 hectares, all of which lies within the Main HNRFI Site. The farm is mixed, with land used for beef production, pigs and arable. A farm shop is also run from within the Main HNRFI Site . One person is employed by the agricultural business.

7.126 A boarding kennel and a farm shop associated with agricultural activity described above operate within the Main HNRFI Site.

Surrounding study area

7.127 From desk research, it is estimated that there are circa 1,800 homes in the surrounding study area, mainly clustered in Sapcote, Aston Flamville and the south-east of Elmesthorpe. No land allocated for residential development in Blaby or Hinckley and Bosworth has been identified within the study area.

7.128 Community land that falls within the study area includes Aston Firs and Burbage Common and Woods , as well as Sheepy Wood. Aston Firs and Burbage Wood are both local SSSI sites. The Blaby District Local Plan allocates Aston Firs as a Green Infrastructure Asset, and Hinckley and Bosworth's Local Plan allocates Burbage Woods as Natural and Semi-Natural Open Space. Regarding community facilities and assets, the study area is sparse. At the very edge of the boundary in Aston Flamville is St Peter's Church. There are no village halls, healthcare facilities or education facilities within the study area.

7.129 The analysis of Valuation Office Agency data identifies 114 business premises in the surrounding study area there are. The equestrian business that is adjacent to the Main HNRFI Site is one of them.

7.130 None of the land inside the Study area is allocated for development or employment uses.

7.131 Across the Main Order Limits and study area, the Public Rights of Way (PRoW) Appraisal and Strategy (Appendix 11.2) identifies a wide range of PRoWs within the site and the 500m study area. PRoWs within Burbage Common and Burbage Wood are generally well used. The remaining PRoW network appears to be only occasionally used.

Health profile

7.132 **Figure 7.14** below shows the health profile of residents in Blaby District where the Proposed Development is located. This shows that Blaby district performs better in the majority of health indicators of Public Health England (PHE) than England. The only exceptions are hip fractures, adult obesity and breastfeeding initiation where Blaby has a lower score than England. This shows that overall the health of residents is better than the national average.

Figure 7.14 Health Profile Blaby District

Compared with England ● Better 95% ● Similar ● Worse 95% ○ Not applicable *Quintiles:* Best ● ● ● ● Worst ○ Not applicable

* a note is attached to the value, hover over to see more details

Recent trends: – Could not be calculated → No significant change ↑ Increasing & getting worse ↑ Increasing & getting better ↓ Decreasing & getting worse ↓ Decreasing & getting better ↑ Increasing ↓ Decreasing

Benchmark Value: Worst/Lowest | 25th Percentile | 75th Percentile | Best/Highest

Indicator	Period	Blaby			Region	England	England		England
		Recent Trend	Count	Value	Value	Value	Worst/ Lowest	Range	Best/ Highest
Life expectancy at birth (Male) New data	2018 - 20	–	-	81.2	79.2	79.4	74.1		84.7
Life expectancy at birth (Female) New data	2018 - 20	–	-	85.1	82.7	83.1	79.0		87.9
Under 75 mortality rate from all causes	2017 - 19	–	707	249	332	326	548		208
Under 75 mortality rate from all cardiovascular diseases New data	2017 - 19	–	125	43.8	72.1	70.4	121.6		39.8
Under 75 mortality rate from cancer New data	2017 - 19	–	336	118.0	131.3	129.2	182.4		87.4
Suicide rate	2018 - 20	–	26	9.6	9.9	10.4	20.3		5.0
Killed and seriously injured (KSI) casualties on England's roads (historic data)	2016 - 18	–	86	29.0	41.6	42.6*	109.8		17.7
Emergency Hospital Admissions for Intentional Self-Harm	2019/20	→	120	123.3	198.9	192.6	457.6		44.5
Hip fractures in people aged 65 and over	2019/20	→	160	760	641	572	981		326
Cancer diagnosed at early stage (experimental statistics)	2017	→	201	51.5%	49.1%	52.2%	36.8%		61.0%
Estimated diabetes diagnosis rate	2018	–	-	78.5%	84.6%	78.0%	54.3%		98.7%
Estimated dementia diagnosis rate (aged 65 and over) < 66.7% (significantly)	2021	→	844	64.5%	64.8%	61.6%	40.8%		83.2%
Admission episodes for alcohol-specific conditions - Under 18s	2017/18 - 19/20	–	10	15.8	25.6	30.7	111.5		7.7
Admission episodes for alcohol-related conditions (Narrow): Old Method	2018/19	→	596	592	700	664	1,127		389
Smoking Prevalence in adults (18+) - current smokers (APS)	2019	–	8,751	10.9%	14.8%	13.9%	27.5%		3.4%
Percentage of physically active adults	2019/20	–	-	66.2%	65.9%	66.4%	49.4%		80.2%
Percentage of adults (aged 18+) classified as overweight or obese	2019/20	–	-	67.5%	65.4%	62.8%	78.3%		41.6%
Under 18s conception rate / 1,000 New data	2019	→	22	13.7	15.4	15.7	37.1		3.9
Smoking status at time of delivery New data	2020/21	→	69	9.1%	12.6%	9.6%	21.4%		1.8%
Breastfeeding initiation	2016/17	→	676	70.1%	69.7%	74.5%	37.9%		96.7%
Infant mortality rate New data	2018 - 20	–	7	2.2	4.2	3.9	8.3		0.8
Year 6: Prevalence of obesity (including severe obesity)	2019/20	→	165	15.6%	20.8%	21.0%	30.1%		10.4%
Deprivation score (IMD 2015)	2015	–	-	10.4	-	21.8	42.0		5.0
Smoking Prevalence in adults in routine and manual occupations (18-64) - current smokers (APS)	2019	–	-	22.9%	25.5%	23.2%	60.3%		3.5%
Inequality in life expectancy at birth (Male)	2017 - 19	–	-	0.4	8.8	9.4	14.8		-1.0
Inequality in life expectancy at birth (Female)	2017 - 19	–	-	-2.6	7.1	7.6	13.3		-2.6
Children in low income families (under 16s)	2016	→	1,610	9.3%	16.6%	17.0%	31.8%		5.8%
Average Attainment 8 score	2019/20	–	57,806	50.8	49.0	50.2	42.9		61.2
Percentage of people in employment New data	2020/21	→	42,200	72.0%	74.7%	75.1%	59.5%		89.0%
Statutory homelessness - Eligible homeless people not in priority need	2017/18	–	-	*	0.4	0.8	-	*Insufficient number of values for a spine chart*	-
Violent crime - hospital admissions for violence (including sexual violence)	2017/18 - 19/20	–	75	26.9	37.1	45.8*	127.7		6.2
Excess winter deaths index New data	Aug 2019 - Jul 2020	–	50	19.1%	18.4%	17.4%	50.2%		0.7%
New STI diagnoses (exc chlamydia aged <25) / 100,000	2020	↓	212	337	408	619	3,547		158
TB incidence (three year average) New data	2018 - 20	–	19	6.3	6.9	8.0	43.1		0.3

Health determinants

7.133 As per the guidance the health determinants are noise and air quality. Baseline conditions of these determinants are set out in the Air Quality and Noise and Vibration chapters. The above determinants are used to assess health effects. The Air Quality and

Noise and Vibration chapters also provide mitigation measures which are taken into account in the assessment.

POTENTIAL SOCIO-ECONOMIC EFFECTS

Construction employment

7.134 The construction of the HNRFI project would help support construction firms operating in the region and provide jobs in the construction industry. The HNRFI project will lead to the creation of new direct jobs on-site and indirect jobs – through supply chain benefits and new expenditure introduced to the local economy.

On-site employment

7.135 To estimate the number of jobs required for the construction of the HNRFI the average output per construction worker for the East Midlands is applied to the estimated value of the construction works. The following steps are then involved:

- Average turnover per construction employee in East Midlands (2018-2020) = £163,938.
- Estimate of number of worker years required for the construction programme based on the value of the construction project = 3,355.
- Estimated length of construction programme = 10years (this would be dependent on market conditions).
- Therefore 3,355 workers years divided by 10 construction years would result in an average of 335 full-time equivalent (FTE) workers on-site per annum.

7.136 The indicative construction programme assumes the development would have a 10 year build period. Given that construction is made up of many discrete elements of work undertaken by specialists (e.g. bricklaying, carpentry, plumbing, electrics, etc) many more construction workers might be employed on the DCO Site for shorter periods at any given point.

7.137 Due to the nature of the construction industry and the different stages involved with the construction of the HNRFI project, not all trades would be required on the Main HNRFI Site permanently and some would be on-site for less time than others. The construction process would include the range of occupational levels including unskilled or labouring jobs to more senior positions, as well as across a range of professional disciplines.

7.138 The baseline research showed that there are more residents employed in the sector than there are jobs in the sector; indicating the study area is a net exporter of construction workers. The HNRFI will play a small role in ensuring a closer match between job

opportunities and local labour.

Off-site employment

7.139 Business in the local and regional economy would benefit from the trade linkages that would be established to construct the development, meaning that further indirect jobs would be supported locally in suppliers of construction materials and equipment. Local businesses would generally also benefit to some extent from temporary increases in expenditure as a result of the direct and indirect employment effects of the construction phase, for example, as construction workers spend their wages in local shops, accommodation and other facilities (induced effects).

7.140 At a national level, multiplier employment effects are estimated to be 2.48 of the on-site employment effects (ONS, UK input-output analytic tables, 2018).

7.141 Employment in the construction sector in the study area was lower in June 2021 than in June 2019. This is not considered to be a result of the coronavirus crisis as the construction sector is anticipated to have recovered by June 2021. Therefore the above suggests that some sufficient latent capacity remains to meet higher output without creating wage or other inflationary effects. There is also a significant labour market (58,300 jobs estimated by the Annual Population Survey, 2020) to accommodate an extra 335 on-site positions. Therefore adverse effects on alternative projects (displacement) are likely to be low.

7.142 The Additionality Guide (fourth edition, Homes and Communities Agency, 2014) recommends applying a 'ready reckoner' for low displacement effects of 25% of positive effects. In this context the ready reckoner is considered to be high, and the current analysis applies a 10% discount to account for potential adverse effects on other construction projects in the study area, based on the relatively small number of on-site positions compared to the overall size of the labour market and the assumption that there are more residents employed in the sector than there are jobs.

7.143 Accounting for the positive multiplier effects and discounting for potential adverse displacement effects results in an estimate of an additional 293 FTE jobs created off-site per annum over the 10 year construction period. The majority of these would be in businesses linked to the construction sector, but some would be local businesses such as cafés and accommodation that would benefit from the new expenditure associated with the on-site workers.

Additionality

7.144 **Table 7.9** summarises the estimates of additional employment from the construction of the HNRFI.

Table 7.9: Additionality of construction employment

Effect	Employment (average FTE per annum) for 10 years
1. On-site	+ 335
2. Displacement (10%)	-34
3. Multiplier (*2.48)	+326
4. Off-site employment (2+3)	+293
Additional (1+4)	+628

Note calculations are rounded to the nearest 10

7.145 **Table 7.9** shows the total on-site jobs created during the construction phase will be 335 jobs per annum. The concept of 'leakage' is not considered relevant here as it is a nationally significant infrastructure project. Once the displacement and multiplier effects explained above have been considered, this equates to 628 net additional construction jobs. Construction is estimated to have a low positive impact on the medium sensitivity construction employment in the relevant study area (where there is, in total, 58,000 residents in construction employment), resulting in a **minor beneficial** effect over the short and medium term.

Employment during operation

On-site employment

7.146 Current levels of employment on-site associated with the agricultural businesses are considered to be negligible in the context of the HNRFI. The expectation is that these businesses would continue into the future in the absence of the HNRFI. This concept is called the reference case. This does not detract from the potential adverse effect the proposals could have on those businesses, covered here separately.

7.147 The Leicester and Leicestershire Strategic Distribution Sector Study (2014) reports that many existing warehouses are becoming functionally obsolete due to three main reasons, two of them driven by technological change:

- Modern automated picking, handling and packaging systems required for the growth in e-commerce cannot be 'retro-fitted' into older buildings.
- Economies of scale can now be gained by operating fewer but larger distribution centres, facilitated by advances in modern ICT inventory management and handling systems
- Increasing desire for some occupiers to re-locate their existing operations to rail-served sites to achieve the financial benefits associated with rail freight.

7.148 The need for the HNRFI is driven partly by these changes, in conjunction with the modal shift to rail freight. But they also indicate the impact of technology on the way logistics operations are organised, with implications for the scale and type of employment required. With the increased incorporation of technology, workers will need to be more

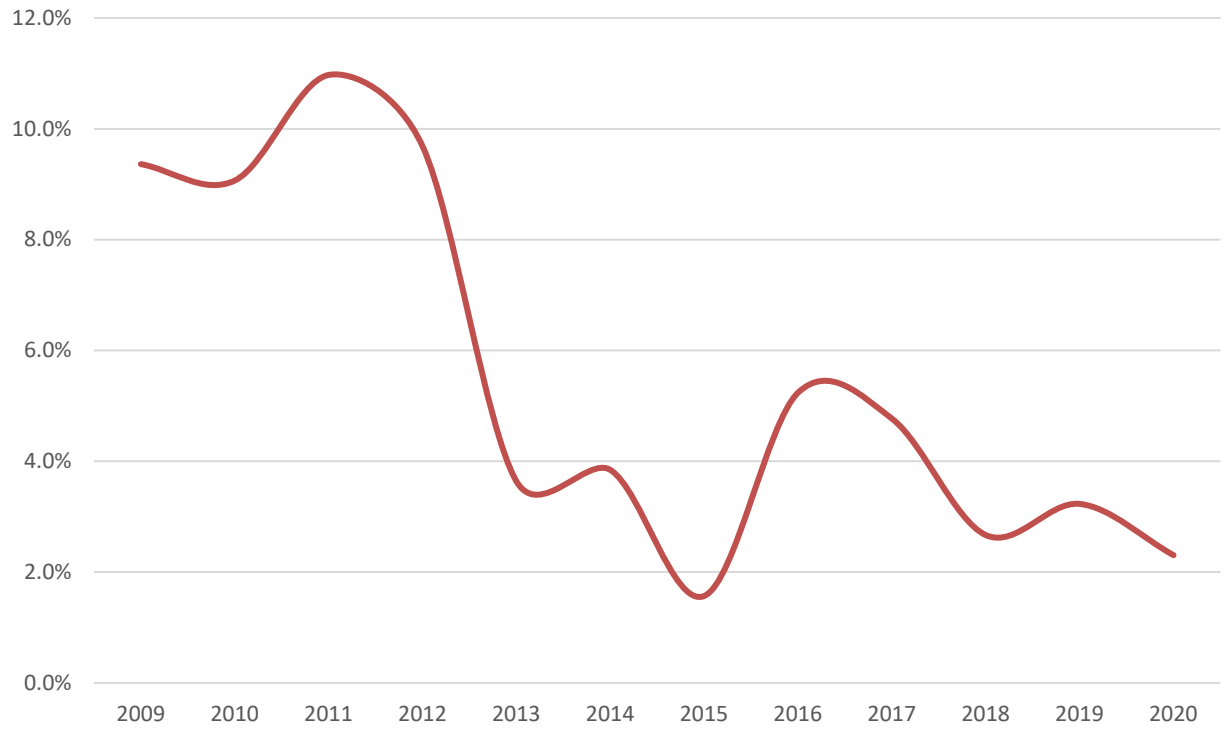
skilled than has been required historically.

7.149 Based on research produced by Prologis surveying its own logistics operations, the HCA advises applying 95sqm of Gross External Area (GEA) per worker for National Distribution Centres (NDCs) and 77sqm (GEA) per worker for Regional Distribution Centres (RDCs; Employment Density Guide, 2015).

7.150 The HNRFI is likely to accommodate a mix of NDCs and RDCs. Therefore , different employment densities associated with each have been used to produce a range of employment estimates.

7.151 The employment densities do not account for vacancy. **Figure 7.15** shows the vacancy levels in warehouse and distribution units within the Golden Triangle since 2009.

Figure 7.15: Vacancy levels in distribution units in the Golden Triangle, 2009-2018



Source: CoStar, accessed July 2018

7.152 **Figure 7.18** shows vacancy rates have consistently dropped since the peak in 2011 and are now low at around 2%. A degree of vacancy is necessary for the market to function efficiently, as businesses relocate to more appropriate premises. More normal levels for the vacancy would be around 6% in Savills' experience. This is around the average of the last 10 years and is applied here.

7.153 Therefore, accounting for vacancy levels at 6%, employment on-site is estimated to be 8,410 – 10,400 workers once fully occupied depending on the employment density

applied. The former number of jobs assumes that the employment density is 95sqm (GEA) per worker, whereas the latter assumes that the employment density is 77sqm (GEA) per worker.

7.154 The baseline set out the changing occupations that are seen in the sector. **Table 7.9** shows the job numbers for each type of occupation that could be employed on-site for both densities of jobs.

Table 7.9: Possible occupational split of employment on-site (FTE)

Occupation	Lower Density	Higher Density
Managers and Senior Officials	924	1,144
Professional Occupations	840	1,040
Association Professional and Technical	1,008	1,248
Administrative and Secretarial	672	832
Skill Trades Occupations	1,260	1,560
Personal Service Occupations	168	208
Sales and Customer Service Occupations	252	312
Process, Plant and Machine Operatives	2,184	2,704
Elementary Occupations	1,092	1,352
Total	8,400	10,400

Source: Savills (2021)

Off-site employment

7.155 As noted earlier in this chapter, the WLLL (2021) reports a need for a new SRFI in Leicestershire up to 2041. The HNRFI would meet this need, but most of the requirement is driven by re-housing logistics activities located in sub-optimal buildings and locations.

7.156 In the high replacement scenario proposed in the above report, 70% of the 2,570,000sqm of new distribution space required to 2041 should replace existing stock and the balance would be growth build.

7.157 Therefore, it follows that approximately 70% of the occupiers at the HNRFI could be relocated from existing, functionally sub-optimal distribution premises in the LLEP area. This effect is displacement; the proportion of intervention outputs accounted for by reduced outputs elsewhere.

7.158 While displacement is discounted from the additionality of employment effects, its impact in this instance is positive – it is helping the LLEP area maintain its competitive advantage in the logistics sector by allocating activities where they are more optimally located. The relocation of logistics companies to the HNRFI will help ensure the long-term sustainability of those businesses and the jobs they support.

7.159 At a national level, multiplier employment effects are estimated to be 1.34 times of the sector employment effects (for the warehousing and support services for the transportation sector, UK input-output analytic tables, 2018).

Additionality

7.160 **Table 7.10** summarises the estimates of additional employment once the HNRFI would be occupied. Again, the concept of 'leakage' is not considered relevant for a nationally significant project.

Table 7.10: Additionality of operational employment

Effect	Employment (FTE)	
	Lower density	Higher density
1. On-site (incl. 6% vacancy)	8,400	10,400
2. Displacement (70%)	-5,900	-7,300
3. Multiplier (*1.34)	1,900	2,300
4. Off-site (2+3)	-4,000	-4,900
Additional (1+4)	4,400	5,400

Source: Savills (2021)
NB: calculations are rounded to the nearest 10

7.161 **Table 7.10** shows that the HNRFI would generate 4,400 – 5,400 additional FTE jobs for the national economy. However, it would also safeguard 5,900 – 7,300 jobs in the LLEP area by relocating logistics activities to a more sustainable location and built environment.

7.162 Of the additional jobs, 2,500 – 3,100 would be new on-site jobs for the residents of the study area. A proportion of the off-site multiplier effects are also likely to benefit the study area. The LLEP HEDNA forecasts that employment will increase in the 'transportation and storage' sector by 6,800 jobs 2011-2036. The additional jobs estimated here would be a component of these forecasts.

7.163 **Table 7.10** shows that the HNRFI would support 8,400 – 10,400 operational jobs. Once the effects of leakage, displacement and multiplier effects have been considered, this equates to 4,400 – 5,400 additional new jobs. The total employment in this sector in 2019 was 50,000, thus the magnitude of employment is expected to be medium positive. The sensitivity of employment for local residents is low. Therefore, the effect of operational jobs from the Proposed Development is predicted to be **moderate beneficial** over the long term.

GVA during operation

7.164 The ONS estimates that each transport and logistics (Sector H SIC) worker generates a GVA of £42,349 per FTE employee. Therefore the addition of between 8,400 – 10,400 on-

site jobs would generate an estimated £364 - £449 million GVA per year.

7.165 GVA to the LLEP economy associated with the 2,500 – 3,100 additional jobs on-site is estimated by applying an annual GVA of £42,349 (2018) per) per FTE employee (transport and storage sector in the East Midlands). This would represent an additional GVA contribution of £109.2 – £134.8 million per annum. In addition to this, the HNRFI would also safeguard the contribution of £255 – £315 million per annum by re-allocating existing logistics jobs to a more optimal location.

7.166 Therefore, the summary of operational GVA effects is summarised in **Table 7.11**.

Table 7.11 Operational GVA per annum effects (2021 prices)

	Lower Employment Density (FTE per 95sqm)	Higher Employment Density (FTE per 77sqm)
Direct GVA per year (due to operational on-site jobs)	£364 million	£449 million
GVA generated by additional jobs created in the Study Area	£109 million	£135 million
GVA safeguarded by the introduction of HNRFI	£255 million	£315 million

Source: Savills (2021)

7.167 This is likely to be a conservative estimate as a proportion of the off-site multiplier effects would also benefit the LLEP area. Although, it should be noted that the HNRFI would have a larger contribution than estimated, as it will help support regional and national economic growth, helping achieve the vision set out in the National Policy Statement for National Networks as outlined previously in the chapter.

Business rate retention

7.168 An estimate of the Business Rates for the Proposed Development indicates that this will create a potential receipt of some £24.65 million per year, depending on confirmed rating valuations. This figure is based on an average rateable value of £50 per m^2. This rate is based upon research of similar industrial and logistics developments in the local area.

7.169 Currently, local government retain 50% of business rates, 40% is kept by the local billing authority (Blaby District Council), and the remaining 10% of it goes to the precepting authorities, which in this case is Leicestershire County Council. **Table 7.12** outlines the revenue that could be received by each layer of government.

Table 7.12 Potential Business Rates Generated

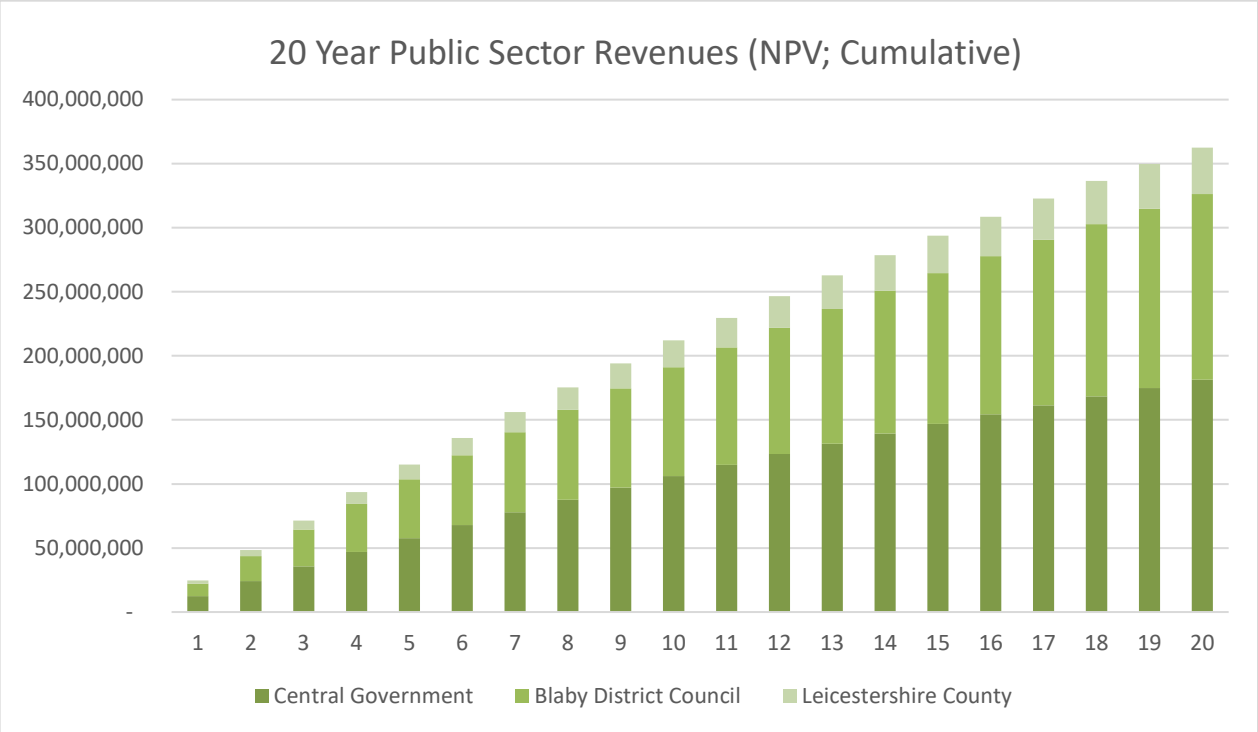
Business rates	Amount received per annum
Total Business Rates Generated (100%)	£ 24.65 million
Business Rates retained by Central Government (50%)	£12.32 million
Business Rates retained by Blaby (40%)	£9.86 million
Business Rates retained by Leicestershire County Council (10%)	£2.46 million

Source: Savills (2021)

7.170 It is worth noting that the local business rate share is anticipated to increase from 50% to 75% but this has not yet been confirmed by the central government.[10] Therefore, this estimate may be a conservative estimate for the revenue that could be generated for local services, but regardless it represents a significant revenue stream.

7.171 If the Proposed Development was to meet the estimate of £24.65 million per annum in business rates revenue and current funding arrangements remained, over 20 years this would accumulate to over £362.6 million in total (net present value, discounting 3.5% per annum in line with Treasury Green Book). Of which, £145.05 million would be retained by Blaby District Council, and £36.26 million by Leicestershire County Council. **Figure 7.16** below illustrates the cumulative income that could be gained by each government layer.

Figure 7.16 Cumulative Business Rates Revenues discounted at 3.5% per annum



Source: Savills (2021)

[10] https://www.lgcplus.com/politics/lgc-briefing/the-business-rates-backlash-29-09-2020/

7.172 In conclusion, whilst it is not possible to state with 100% confidence what the overall amount of benefit will be for local authorities, it is clear that the business rates associated with the Proposed Development will represent a substantial addition to their revenue stream.

Demand for housing

7.173 The baseline assessment estimated that there are 58,000 residents in the study area employed in construction, but approximately 32,000 construction employees work in the study area. Therefore, the study area sees a net export of residents in construction. Therefore, the addition of 335 construction jobs will likely be met by the local workforce. Consequently, this will have a negligible impact on demand for housing.

7.174 For operational employment, the HEDNA forecasts an additional 6,800 jobs in the transport and storage sector, 2011-2036, with 3,050 additional jobs at strategic distribution development sites. The optimal location for strategic distribution development is identified as a new SRFI; the HNRFI meets this need. The HNRFI accounts for a large part of the additional strategic logistics jobs (2,500 – 3,100 new on-site jobs).

7.175 The HEDNA was produced in 2017 and the assessment of housing need accounts for this labour market growth, but the allocation of housing need between local authorities is currently being updated.

7.176 Under current assumptions, the HEDNA forecasts an increase of +100 jobs in BDC 2011-2036 (Table 20), the lowest employment growth of any of the Councils in the LLEP area. The proportion of jobs growth for BDC would likely need to be increased, with a re-allocation from other local authority areas (although the +100 jobs for BDC is a net forecast and might account for growth in the logistics sector offsetting decline in other sectors).

7.177 Implications for housing growth would be taken forward through joint working between the local authorities through the Duty to Cooperate. This mechanism is currently used by the local councils surrounding Leicester City to meet Leicester City's unmet housing need.

7.178 Subsequently, the impact of additional residents due to the Proposed Development employment in the short, medium and long term is likely to have a negligible impact on housing demand. The overall effect will be **neutral** over the short, medium and long term.

Logistics sector

7.179 The baseline outlines that the LLEP development needs 2,751,000sqm of new build strategic distribution premises to replace ageing premises, as well as serve increasing demand. This development is estimated to deliver up to 850,000sqm of logistics floorspace, which equates to almost 30% of the requirement outlined in the HEDNA.

7.180 The impact magnitude of the Proposed Development for the logistics sector would be

high positive, and the sensitivity of local businesses would be high. Thus it is anticipated this would be a **major beneficial** over the long term.

Land use and accessibility

Private Property and Housing

7.181 Table 7.13 below provides relevant conclusions from Transport and Traffic, Noise, Air Quality PEIR chapters and Lighting Proposed Development External Lighting Statement. These inform the assessment.

Table 7.13 Technical Documents Conclusions

Source	Relevant technical conclusion
PEIR Transport and Traffic Chapter (Chapter 8)	The HNRFI, with the proposed mitigation improvements in place is considered to have an overall direct effect of long-term minor adverse significance. This is because traffic from the Main HNRFI Site be distributed along major roads which already accommodate heavy traffic, such as the M69, and therefore any severance issues will already exist.
PEIR Air Quality Chapter	Chapter 9 analyses the predicted changes concentrations of NO2, PM10 and PM2.5 for various human receptors. It concludes that existing concentrations of NO2, PM10 and PM2.5 in the study area are predicted to be below the relevant air quality objectives at all receptors and the Proposed Development does not lead to any new exceedances of the air quality objective.
PEIR Noise Chapter	The existing ambient noise levels are predicted to increase by up to 3.1dB during the weekday and weekend daytime and night-time as a result of the proposed operations of the SRFI, with mitigation in place. This level of change is considered marginal, and would barely be perceptible to the human ear with changes of 3dB only just perceptible under laboratory conditions. As such, an increase of 3dB is considered to be low.
External Lighting Statement	The Proposed Development proposes a detailed lighting design to minimise light pollution, complying with relevant policy and guidance. The main principles to be followed are: • All areas within the development are lit adequately to the relevant policy and guidance, depending on the purpose, intended usage and to ensure safety; • Meet relevant standards and Client requirements, and where possible to emphasise the developments key spaces and views;

Source	Relevant technical conclusion
	• Minimise crime and promote safety throughout the development; and • Minimise light pollution. The detailed lighting strategy is anticipated to be ready for submission with the ES.

7.182 Taking into consideration the conclusions of the above technical assessments and the proposed mitigation a discernible change in the attributes and quality of the local houses is anticipated. Severance levels will be kept constant with the proposed mitigation. Therefore as per the guidance the effect of the proposed development on the highly sensitive local houses identified in the baseline would be **minor adverse effect** over the long term.

Community land and assets

7.183 Access to Burbage Woods and Common will be affected by the Proposed Development. However, this will be mitigated by the shared pedestrian and cycleway on the new A47 link road through the Main HNRFI Site. The proposed pathways and the proposed bridleway corridor will retain the existing north-south link affected by the Proposed Development. PRoW Appraisal and Strategy (Appendix 11.2) concludes that once the assessment's recommendations are considered then PRoWs do not represent an 'in principle' constraint to development of the Main HNRFI Site. The development of the Main HNRFI Site is considered to provide a notable opportunity to enhance the provision and connectivity of PRoWs across the site and with the wider surrounding landscape for a variety of users. Access to St Peter's Church is unlikely to be affected due to its location.

7.184 The above will result in very minor introduction of severance with ample accessibility provision. Therefore as per the guidance the effect of the Proposed Development on the medium sensitive community land and assets identified in the baseline would be **neutral effect** over the long term.

Development land and businesses

7.185 The boarding kennels business, which is located within the Main HNRFI Site would cease operation permanently. However, the phased development of the Proposed Development will allow temporary use of the land as construction progresses. As this is a small employment site the effect of the Proposed Development on the low sensitive local businesses would be **minor adverse** over the long term.

7.186 The businesses in the surrounding study area will be affected in a similar way with local housing. The equestrian business next to the Main HNRFI Site is not anticipated to be affected due to the proposed bridleway network of the Proposed Development. Taking into consideration the conclusions of the above technical assessments and the proposed

mitigation a discernible change in the attributes and quality of the local houses is anticipated. Severance levels will be kept constant with the proposed mitigation. Therefore as per the guidance the effect of the Proposed Development on the highly sensitive local houses identified in the baseline would be **minor adverse effect** over the long term.

Agricultural land holdings

7.187 Farming operations and agricultural businesses within the Main HNRFI Site will be acquired and permanently cease operation. Therefore the Proposed Development is anticipated to have a **major adverse effect** on the highly sensitive agriculture holdings within the Main HNRFI Site. However the landowners would gain financially from the sale of the land.

Walkers, cyclists and horse-riders

Air quality

7.188 As set out above the Proposed Development does not lead to any new exceedances of the air quality objective. Therefore the effect of the Proposed Development on Air Quality is considered to be 'negligible'. This is also applicable to walkers, cyclists and horse riders.

Noise and vibration

7.189 The Proposed Development is anticipated to affect the tranquillity of community land and the walkers, cyclists and horse riders, who are its main users. Chapter 9 includes a tranquillity assessment. This concludes that the Proposed development will affect the tranquillity of Freeholt Woods.

7.190 The impact of the Proposed Development will **minor adverse** on the medium sensitive walkers, cyclists and horse-riders over the long term.

Health outcomes

7.191 Out of the two health determinants the Proposed Development is anticipated to affect only noise levels. This will affect local residents and WCH. By taking into account the health profile of the local residents, which is better than the national average the Proposed Development is anticipated to have a **minor adverse** effect on the health of local residents over the long term. This is only applicable in the unlikely event of the effect on the tranquillity of Freeholt Woods discouraging people from walking or cycling.

PROPOSED MITIGATION

7.192 Adverse land use and socio-economic effects are anticipated for the existing agricultural land holdings. These will be mitigated by the financial gain of the owners form the sale of

the land.

7.193 No additional mitigation measures are required apart from the measures proposed in the transport and traffic, air quality and noise and vibration chapters.

RESIDUAL ENVIRONMENTAL EFFECTS

7.194 The residual effects with the exception of agricultural land holdings remain the same as described in Potential Significant Environmental Effects of the Proposals section as no significant adverse effects were identified and there is no need for mitigation in addition to the one proposed from other PEIR technical chapters.

7.195 The residual effect of agricultural land holdings after mitigation is anticipated to be negligible.

CLIMATE CHANGE

7.196 A future climate change scenario has been developed using UKPC18 projections published by the Met Office. UKCP18 projections are based on the latest developments in climate science and translate global climate change statistics into changing seasonal weather characteristics for the UK. This is used to facilitate consideration as to how the environmental and socio-economic effects of a Proposed Development may change under a future climate scenario.

7.197 The projection with central UK mean has been used in this analysis. The timeframe considered most relevant for the proposed scheme covers 2070-2099. Several environmental factors are likely to vary in the future due to climate change. These include warmer air temperature with warming being greater in the summer, significant increase in winter precipitation, and decrease of summer rainfall and sea level rise.

7.198 When considering climate change effects, it is necessary to firstly consider the vulnerability of specific receptors to climate change. High vulnerability receptors are those where the receptor is directly dependent on the existing or prevailing climate. Moderate vulnerability receptors are those where the receptors are dependent on some climatic factors, but able to tolerate a range of conditions. A receptor that is of low vulnerability is one where climate has little influence on the receptor.

7.199 In the context of socio-economics, it is considered that climate factors have little influence on most receptors.

7.200 Under a future climate, the possible socio-economic considerations of relevance to the HNRFI primarily relate to health risks, and are thought to be as follows:

- an increased risk of over overheating due to a forecast increase in mean average air

temperatures;

- a reduction in cold-weather related illness in winter due to forecast increases in mean average air temperatures;

- an increased risk of surface water flooding, and associated water borne disease resulting from an increase in average annual precipitation and sea level rise.

7.201 All of the above have the potential to place an extra burden on HNRFI employees and therefore they are considered to be of moderate vulnerability to climate change.

7.202 It is considered that whilst the effect of climate change could magnify any adverse effects on employees it is assessed as being relatively low. As such, under a future climate, the effects of the Proposed Development on employees are anticipated to remain as presented for the Proposed Development under the current climate conditions.

CUMULATIVE EFFECTS

7.203 In order to assess the cumulative effects of the Proposed Development and other development projects we use the long list of cumulative sites and go through the stage approach below to create the shortlist for this PEIR chapter.

- ***Stage 1:*** The ZOI is established as the study area for construction and operational employment identified above for each stage. Therefore all the cumulative sites are shortlisted.

- ***Stage 2:*** Tier 1 cumulative sites are shortlisted due they are considered the most certain. Infrastructure projects and redevelopment of existing facilities are also scoped out as they are not relevant for this assessment. This category include seven cumulative sites

7.204 This shortlist cumulative sites include 33 sites with 20 being primarily residential and the rest commercial. In total the cumulative sites include circa 11,600 residential units and 67,401sqm of employment floorspace (B1,B2,B8).

7.205 The assessment below is preliminary with a full assessment to be undertaken prior to the ES submission.

Construction employment

7.206 The construction of the cumulative sites would help support construction firms operating in the region and provide jobs in the construction industry. Due to lack of detailed information on the cost and duration of the construction phases of these sites it is not feasible to make detailed projections.

7.207 **Table 7.9** shows the total on-site jobs created during the construction phase of the

Proposed Development. These will be 335 jobs per annum. Once the displacement and multiplier effects explained above have been considered, this equates to 628 net additional construction jobs.

7.208 It is judged that the cumulative developments will have a medium positive impact, and considering the medium sensitivity of construction employment in the relevant study area, it is likely that the overall impact will be **moderate beneficial** in the short and medium term.

Employment during operation

7.209 The cumulative developments would support job creation in the local area. It is not feasible to make detailed projections of the number of jobs created given the high number of new developments and limited detail. However, from the shortlisted cumulative sites propose 67,401sqm of additional commercial floorspace.

7.210 **Table 7.14** below estimates the possible jobs created in operational employment of the cumulative developments. It uses the average employment density of 47 sqm for Office, Light Industrial, Industrial and Warehouse from The Employment Density Guide 2015 from HCA. We also use a medium displacement based on the ready reckoners of the additionality guide.

Table 7.13 Cumulative developments operational employment

Effect	Employment (FTE)
1. On-site (incl. 6% vacancy)	1,400
2. Displacement (50%)	-700
3. Multiplier (*1.3)	900
4. Off-site (2+3)	200
Additional (1+4)	1,600

7.211 The cumulative sites are estimated to generate circa 1,600 jobs. **T**he magnitude of employment is expected to remain medium positive. The sensitivity of employment for local residents is low. Therefore, the cumulative effect of operational jobs from the Proposed Development is predicted to be **moderate beneficial** over the long term.

Demand for housing

7.212 The cumulative developments are expected to generate approximately 11,600 residential units. It could be anticipated that the increase in employment floorspace will lead to further demand for housing. The HEDNA forecasts an additional 99,200 jobs between 2011 and 2036. The HEDNA was produced in 2017 and the assessment of housing need accounts for the above labour market growth, but the allocation of housing need between local authorities is currently being updated.

7.213 Subsequently, the impact of additional homes and commercial floorspace due to the cumulative sites is likely to have a negligible impact on housing demand. Therefore the likely overall effect will be **neutral** over the long term**.**

Land use and accessibility

7.214 It is judged that the cumulative developments will have a neutral impact for private property and housing, community land and assets, agricultural land holdings and Development land and businesses. This is due to the location of the location of the cumulative shortlisted sites being at least 1km away from the Main HNRFI Site and therefore not in the study area.

Health outcomes

7.215 The cumulative schemes are expected to adhere to local policy requirements and propose their own mitigation measures in terms of health outcomes. Therefore, it is reasonable to assume that they will have no adverse health impacts over the long term. Further analysis will be provided with the submission of the ES.

CONCLUSIONS

7.216 The land use and socio-economic effects chapter concludes that the Proposed Development will have a significant beneficial effect by generating net additional jobs and by providing addition floorspace to the businesses of the logistics sector. The labour market for these jobs covers a number of local authorities as analysed above. Therefore the Proposed Development is expected to further improve employment rates in the above local authorities

7.217 The assessment also concludes that no significant adverse land use and socio-economic effects are anticipated from the proposed scheme.

7.218 The SEP for Leicester and Leicestershire identifies that the lack of suitable land *for 'our most land intensive priority sectors (logistics and manufacturing)'* is a major risk to the economy.

7.219 The SEP states that the A5 Corridor close to the HNRFI and within the South West Growth Area is identified as playing a 'pivotal role' in supporting ambitions for the logistics sector.

7.220 The Warehousing and Logistics in Leicester and Leicestershire study (2021) identifies a need for 2,751,000 sqm of warehouse floorspace by 2041. This comprises 1,106,000 rail-served and 1,466,000 road-served floorspace.

7.221 The above forecast suggests that there is still a demand for SRFI in Leicestershire in addition to the East Midlands Gateway and East Midlands Distribution Centre SRFI schemes.

7.222 The HEDNA forecasts an additional 6,800 jobs in the transport and storage sector, 2011-2036, with 3,050 additional jobs at strategic distribution development sites. (This does not account for the relocation of jobs from older distribution premises to new developments.)

7.223 The assessment of housing need accounts for this labour market growth, but the allocation of housing need between local authorities may need to be revised once the locations of strategic distribution developments are confirmed.

7.224 The chapter estimates that HNRFI will generate:

- 628 net additional FTE jobs per annum during the 10 year construction period;
- 8,400 – 10,400 permanent jobs will be generated at HNRFI's operations stage, of which 4,400 – 5,400 are anticipated to be net additional for residents.

7.225 The total GVA produced by HNRFI's operations stage due to the total jobs generated will be £364 - £449 million per annum. Farming operations and agricultural businesses within the Main HNRFI Site would permanently cease but the landowners would gain financially from the sale of the land.

7.226 Finally under a future climate scenario, the effects of the proposed scheme on employees are anticipated to remain as presented for the Proposed Development under the current climate conditions.

Tritax Symmetry (Hinckley) Limited

HINCKLEY NATIONAL RAIL FREIGHT INTERCHANGE

Preliminary Environmental Information Report

Chapter 8: Transport and traffic

January 2022

This document forms a part of a Preliminary Environmental Information Report (PEIR) for the Hinckley National Rail Freight Interchange project.

A PEIR presents environmental information to assist consultees to form an informed view of the likely significant environmental effects of a proposed development and provide feedback.

This PEIR has been prepared by the project promoter, Tritax Symmetry (Hinckley) Limited. The Proposed Development is described in Chapter 3 of the PEIR and is the subject of a public consultation running from 12 January to 9 March 2022.

Details of how to respond to the public consultation are provided at the end of Chapter 1 of the PEIR and on the project website:

http://www.hinckleynrfi.co.uk/

This feedback will be taken into account by Tritax Symmetry (Hinckley) Limited in the preparation of its application for a Development Consent Order for the project.

Chapter 8 ◆ Transport and traffic

INTRODUCTION

8.1 The purpose of the transport and traffic section of the Preliminary Environmental Impact Report (PEIR) is to describe and, where possible, quantify the likely significant effects that the Proposed Development will have on the surrounding transport network and traffic and transport impacts on the environment.

8.2 This PEIR addresses the potential effects of the Proposed Development on traffic and transport. The assessment considers: the present-day and future baseline conditions at opening; and the effects of operational and construction traffic (including maintenance) on the local road network as a result of the Proposed Development;

8.3 This section of the PEIR is based on the description of development of the HNRFI as set out at Chapter 2: *Site description* and Chapter 3: *Scheme description*. The Chapter is informed by extensive technical collaboration with a Transport Working Group made up of Highway and Planning authorities in the vicinity of the Proposed Development and LCC Network Data Intelligence modelling framework team prior to consultation. The Chapter includes a multi-modal impact assessment that considers the impact of the Proposed Development on all transport infrastructure surrounding the HNRFI Site.

8.4 In accordance with guidance[1], the information presented in this Chapter is considered 'preliminary'; the PEIR submission forms an integral part of an iterative process for both the design of the Proposed Development and the EIA and will therefore take into consideration any comments received through this consultation.

METHODOLOGY AND DATA SOURCES

Consultation

Transport Working Group

8.5 A Transport Working Group (TWG) was established comprising representatives from National Highways (NH) (Formerly known as Highways England), AECOM (National Highways term consultant), Leicestershire County Council (LCC), Warwickshire County Council (WCC), Leicester City Council (LCiC), Coventry City Council (CCC), Blaby District Council (BDC) and Hinckley & Bosworth District Council with TSH and BWB Consulting Ltd as the applicant's Transport and Highway consultants.. The objectives of the TWG are:

[1] The Planning Inspectorate (May 2020): Advice Note Seven (Version 7); Environmental Impact Assessment: Process, Preliminary Environmental Information and Environmental Statements
on the local community and infrastructure

- to provide a forum for consultation with the regulatory stakeholders; and
- to allow agreement, in a phased and methodical process, of the key components of the transport work that are required to support the DCO submission and ES Chapter.
- To date trip generation, distribution, planning and infrastructure uncertainty log have been reviewed and signed off by the key highway authorities. Base and forecast models have been subject to further analysis by the TWG for final sign-off.
- Additional analysis of throughputs at Narborough Station and Level Crossing have been taken into consideration, based on discussions with the TWG. Further detail has been provided by Network Rail.

8.6 Following removal of the Dodwell/Longshoot widening scheme, there has been further analysis of impacts using additional data in the base model, which is currently ongoing. The TWG group meets on a monthly basis. This provides a platform to inform the wider authorities of the modelling progress, share information and agree timescales for agreement/submissions that are key for the Transport Assessment (TA). Two sessions within the year have been used to review comments on the Base and Forecast modelling with the Leicestershire County Council Network Data Intelligence Framework Modelling team (September and October 2021). This enabled a clearer communication of suggested amendments and changes.

Other consultation

8.7 There have also been a series of catch-up meetings with LCC Highway Development Management team (LCC HDM) and a representative from HBBC on a fortnightly basis. Individual meetings with WCC/NH have been on an ad-hoc basis to discuss the assessment approach and agreements to the modelling both on the SRN and in Warwickshire. Specific area based discussions have happened with LCiC and the planning authorities in Blaby and Hinckley and Bosworth. See Table 8.2 for a summary of the consultation with the TWG and respective authorities.

8.8 For the public and sustainable transport inputs to the strategy, a meeting was held with representatives of LCC public and active travel teams in August 2021. This led on from a discussion with Arriva Buses in 2021 and earlier engagement with Stagecoach 2019 regarding services in the area and potential ability to link the Site to new and existing services. Further development and meetings are due in the coming months.

The 2020 Scoping Opinion

8.9 A request for a Scoping Opinion was submitted to PINS in November 2020. The new scoping covered amendments and updates since the project was reviewed in 2019. A Scoping Opinion document was received in December 2020 from the Planning Inspectorate.

8.10 Comments specific to Transport and Traffic were provided in the 2020 Scoping Opinion. These are included below for completeness. Each of the comments have been considered

in the authoring of this PEIR Chapter and are included or qualified if excluded.

Table 8.1: Planning Inspectorate's comments from EIA Scoping Opinion in relation to Transport and Travel (December 2020)

PINS ID Paragraph	Ref	Comments	Response
4.21	Hazardous loads	The report states that any hazardous loads transported to/ from the distribution centre would be assessed and managed in line with the relevant environmental permits and associated legislation and they are not a matter for the Transport Assessment (TA) or the ES. There is no estimate of expected hazardous load movements provided. The Inspectorate considers that should hazardous loads be likely to be transported to and from the distribution centre, the impacts of these in terms of the increase in vehicle movements should be considered in the ES. The Applicant is referred to paragraph 3.3.17 of this Opinion regarding Risks of Major Accidents and Disasters	The number of hazardous loads cannot be quantified at this stage of the appraisal given that construction and operational requirements have not been confirmed. Should hazardous loads be required, the consultant has assumed in respect of traffic movements that any hazardous loads will be via HGV's and are therefore included within the overall HGV numbers modelled. Therefore, the vehicle movements have been captured within the assessment of HGV traffic generation. In respect of hazardous loads this is covered under separate legislation and the risks of Major Accidents and Disasters are appraised in Chapter 19 of this PEIR.
4.2.2	Guidance	Table 7.1 refers to Strategic Rail Freight Interchange Policy Guidance (November 2011). This document was withdrawn on 27 March 2018 and has been superseded by National Policy Statements for	Noted: The correct reference has been referred to in accordance with the comment.

		National Networks. Table 7.4 states that the ES will be carried out in accordance with Volume 11 of the DMRB. This guidance has been superseded by the new DMRB structure and coding system. The ES should apply the latest version, see LA 101 - Introduction to environmental assessment, and LA 104 - Environmental assessment and monitoring	The consultant acknowledges the comment and notes that references to LA101 and LA104 have been updated for the purposes of this appraisal.
4.2.3	Consultation	The report states that the Transport Working Group (TWG) is meeting regularly to discuss and agree key elements of the TA methodology. The ES should document and evidence the outcomes of these discussions when describing the traffic and transport aspect methodology.	Noted, the consultation section of the PEIR and ES will document this.
4.2.4	Rail freight	In response to a comment in the previous 2018 Scoping Opinion, the Scoping Report stresses that rail freight movements have been factored into the Trip Generation, and this will be explicit in the TA and ES (para 7.23). Paragraph 7.44 confirms that rail freight has been forecast and that resultant Heavy Goods Vehicle (HGV) trips have been included within the strategic modelling process. However, the	Both WSP and Baker Rose, rail freight specialists, acted in support of the assessment and on behalf of the applicant to provide for the information as requested. This has been utilised where appropriate in this chapter. This information has been shared with LCC and allowance has been factored into the next phase of the PRTM 2.2

		description of baseline conditions within the report does not mention rail freight, and the methodology refers to highway links and thresholds relating solely to changes in road vehicle flows. The ES should consider the impacts of the Proposed Development on the capacity and operation of the rail network, and the potential impacts of an increase in rail freight movements on environmental matters, for example, accidents and safety, and any potential indirect effects on passenger rail transport operations and the growth, where significant effects are likely. The Inspectorate highlights Solihull Metropolitan Borough Council's proposal for mitigation in the form of a contribution towards wider industry initiatives (such as an east-west rail link at Nuneaton) for consideration. The impact of freight trains on the Narborough level crossing is also highlighted (see consultation response from Sharnford Parish Council).	modelling. Network Rail has confirmed that the addition of new train paths for the Proposed Development will be required to fit around the existing services within the working timetable. Network Rail has both contractual and regulatory obligations to existing users of the network in terms of the timing of their trains in the working timetable. These paths are neither guaranteed nor reserved for the Proposed Development, but demonstrate the availability of paths for trains in the working timetable on this route on the rail network. Further details of rail safety is included in Chapter 19 Accidents and Disasters See NR response above Further feedback from Network Rail (NR) has been provided in terms of train paths and impacts on the local level crossing at Narborough. NR has confirmed that for the Highway AM and PM

			Peak Hours, there is only one additional train path available in the PM peak. This train path would be open to all operators to bid for and not safeguarded for HNRFI.
4.2.5	Assessment years	The Scoping Report states that the following years will be assessed: base year (2014)- validated using 2018 observed flows; anticipated first year of occupation (2025); and ten years post-occupation (2036). The Inspectorate understands that the freight model does not have a 2025 assessment year, but every five years from 2021 instead. Assessment years will need to be clarified and agreed with the Transport Working Group, as well as methodologies for assessment years not coinciding with those available. Junction capacity assessments and merge/diverge assessments (where appropriate) must be carried out for the following scenarios: • Opening Year Reference	Noted, the PRTM model contains 2014 (base) validated using 2018 flows and 2026 assessment year. The opening year has recently been reconfirmed as 2026 by the applicant. The reference scenarios are noted and have been agreed through the TWG. A future year of 2036 is planned. All scenarios have been subject to a model brief which has been ratified by the TWG prior to model commencement.

		Scenario (the year in which the development is expected to be opened); • Opening Year Reference plus Committed Development Scenario; and • Opening Year Development Scenario – Opening Year plus Committed Development plus the Proposed Development, which will determine whether any mitigation is required for the Strategic Road Network (SRN). The impact of the development should also be assessed for ten years after the year the application is registered or the end of the relevant Local Plan whichever is the greater.	This also allows for a scenario which includes the proposed access infrastructure without Proposed Development. This is in order to understand the changes in background traffic distribution brought about by the new infrastructure.
4.2.6	Screening process	The report describes thresholds for determining which road links should be subject to a detailed assessment, referencing the IEMA (1993) Guidelines for the Environmental Assessment of Road Traffic. The guidance states in paragraph 3.19 that "where there are major changes in the composition of the traffic flow, say a much greater flow of HGV's, a lower threshold may be appropriate". The Scoping Report suggests a 30% increase in HGV movements as an	In response, the consultant notes that 10% HGV impacts have been recorded in locations close to sensitive receptors as per IEMA suggested thresholds. This is considered a robust approach to the assessment.

		alternative threshold. Any threshold should consider the local context and be agreed within the TWG (justified and evidenced within the ES).	
4.2.7	Receptor sensitivity	The sensitivity of receptors should also consider the needs of major road users such as Royal Mail, particularly for the analysis of delays to drivers	Noted, Royal Mail Distribution centre will be included as a sensitive receptor and any other major businesses and road users in the area such as Triumph.
4.2.8	Committed developments	The Scoping Report states that known committed developments in the vicinity of the Site have been included in the assessment. Note the additional development recommended for inclusion by Warwickshire County Council in their consultation response.	The assessment considers new and committed developments as set-out in chapter 20 of this PEIR in order to appraise the in combination effects. Further data has been shared with WCC in relation to links and sites mentioned in their response and these have been included in addition to those referenced above. As part of the PRTM Core Forecast Model a full review of Planning and Infrastructure logs have been undertaken for the Area of Influence with the Transport Working Group members. This log contains all allocated and consented planning applications and relevant access infrastructure and associated off-site improvement schemes . The modelling

			corresponds with guidance set out in DfT TAG Unit M4, 'Forecasting and Uncertainty October 2013'.
4.2.9	Road safety	Given the Proposed Development will affect the SRN, the ES or the Transport Assessment must be accompanied by a Stage 1 Road Safety Audit.	Stage One Road Safety Audits will be undertaken for junctions where mitigation is proposed. A safety review will be included within the ES for all links affected.

Consultation feedback

8.11 Feedback from local planning authorities, parish councils and other statutory consultees was received in response to the 2020 scoping request and summarised in the Table above.

8.12 Comments provided by the consultees varied in emphasis. Both NH and LCC, as key highway authorities, form part of the TWG set up to address the technical details of the TA and ES Traffic and Transport Chapter. Therefore, their views and guidance have been ongoing through the pre-planning period.

8.13 Table 8.2 below indicates the key consultation and agreements with the TWG and separate authorities through the past twelve months.

Table 8.2 Consultation Log TWG and Authorities

Organisation	Sep-20	Oct-20	Nov-20	Dec-20	Jan-21	Feb-21	Mar-21	Apr-21	May-21	Jun-21	Jul-21	Aug-21	Sep-21	Oct-21	Key Agreements
Transport Working Group; LCC, NH, LCiC, HBBC, Blaby, WCC, CCC			19	17	21	18	18	15	20	-	15	19	16	21	Trip Generation and Distribution Uncertainty Log- Planning and Infrastructure Modelling the Buffer Area *Initial Review of HGV Routing Inputs to STS* Inputs to Model Brief Base Model
LCC HDM				21			17	14	12	9, 23	21	4,18	1	6,20	Regular review of progress against TWG meetings
LCC NDI	29				22		2, 16	16							Approach to addressing concerns with PRTM Modelling
NH							24	14			7				Discussions on J2 Addressing the WCC buffer area within PRTM
WCC	14						24								Addressing the WCC buffer area within PRTM
LCiC				17		3									Impacts on Narborough Road, Public Transport Opportunites
LCC Growth				21											Informative
HBBC					20		17	14	12	9	21	4,18			Regular review of progress against TWG meetings
Inception Modelling ; TWG Members							5								Base Modelling Inputs
LCC PROW, Public Transport												25			Way forward for ST S Consideration of Existing Initiatives

8.14 Further comments from other consultees focus on several key areas, all of which have been considered within the PEIR or Interim TA where appropriate at this time and will be incorporated into the final ES and TA submissions. These include: Heavy Goods Vehicle (HGV) routing, construction traffic management, public transport provision, sustainable modes, including footways and cycleways and off-site mitigation.

8.15 An initial public consultation on the HNRFI site took place between October and December 2018. During this consultation particular concern was raised by members of the public around highway impacts of the new development and the introduction of South Facing slips to Junction 2 of the M69.

8.16 Options for mitigation were investigated by the applicant team and a further highways specific informal public consultation exercise took place between 9 July and 6 September 2019. This was prior to submitting the Scoping Report in November 2020. The consultation included six public exhibitions, social media coverage and website access. Overall, 460 feedback forms were received along with 40 email enquiries, 84 online forms, 8 phone calls and 2 letters.

8.17 The results from the feedback highlighted significant local opposition to the anticipated highway impacts of HNRFI. Over 36% of respondents cited local traffic increases as their number one priority.

8.18 In response to the 2018 consultation a review of traffic impacts suggested potential by-passes, these were presented in the informal 2019 consultation; a) to the east of Stoney Stanton and b) to the south of Sapcote. The feedback from the 2019 consultation, when the proposals were presented for both, was overwhelmingly negative. For a) 94% of respondents opposed the plan and for b) 78% of respondents rejected the plan. However, a better response was received for the A47 link road with 47% either responding positively or neutrally to the proposals.

8.19 Over 61% of respondents considered local public transport to be inadequate.

8.20 The feedback provided by the respondents helped shape the conversations with the relevant authorities in terms of appropriate highway and transport interventions needed for the 'Proposed Development'.

8.21 The TA examines the trip generation, distribution and assignment of trips associated with the Proposed Development. The Proposed Development trips on the existing transport infrastructure have been reviewed and assigned at a strategic level using the Pan-Regional Transport Model (PRTM) which is a SATURN (Simulation and Assignment of Traffic to Urban Road Network) model and is maintained by LCC, covering the county and the wider Midlands area. The outputs from the model have been used to assess the capacity and impacts on the highway network from the Proposed Development and represented in the TA.

8.22 The PRTM is a further development of the original Leicester and Leicestershire Integrated Transport Model (LLITM) model. This high-level assessment identified junctions within the Study Area which might be at risk of reaching or exceeding their capacity and these

have been modelled within the TA in detail at a local level with use of industry standard software. A package of transport infrastructure improvements has been developed to mitigate adverse transport impacts associated with the Proposed Development.

8.23 The mitigation package represents an evolution of the proposals put forward at previous consultation. This is rooted in the evidential base provided by the outputs from the PRTM model and was also combined with feedback to the 2019 informal consultation. The A47 link Road now forms part of the Access Infrastructure for the site, linking Junction 2 of M69 with the B4668 to the north-west.

8.24 The TA and accompanying TP will examine the accessibility of the HNRFI Site by public transport, cycling and walking, and identify the likely modal split of person trips associated with the Proposed Development. The TA will evaluate the impact of the development trips on the surrounding transport facilities, including an appraisal of HGV movements. Where required, the TA will identify improvements, which, in combination with the TP, will cater for the increased travel demand.

Data sources

Pan Regional Transport Model PRTM

8.25 The Leicester and Leicestershire Integrated Transport Model (LLITM) was developed by AECOM for LCC between 2009 and 2011. Subsequently as the strategic modelling demand increased, a more detailed variant of the model was produced. The assignment models contained within this suite, including the highway model, were developed to represent a typical weekday with a base year of 2014, with a neutral month of April/May/June.

8.26 The Pan-Regional Transport Model (PRTM), referred to is explained further within the Local Model Validation Report (LMVR) which is provided in the ITA Appendix 5 (appendix 8.1). The PRTM was initially developed as a variant of LLITM for a strategic road scheme appraisal which included sections outside Leicestershire in the LLITM fixed-speed buffer network. Since then, a large area of the Midlands surrounding Leicestershire has been updated with more detailed network and zoning with congestion represented by speed-flow curves. New calibration data was also added to the PRTM area to calibrate the external areas of the matrix. This calibrated model has subsequently been used for several applications.

8.27 LCC Network Data Intelligence (NDI) Framework Modelling team were commissioned to undertake the strategic highway assignment modelling for the core network around the HNRFI using the Pan-Regional Transport Model v2.2 (referenced in the ITA Appendix 6(appendix 8.1)) for AM Peak and PM Peak hours. As part of this work, a review of the base year highway model in the vicinity of the HNRFI has been undertaken to set out the performance of the model in this area.

8.28 A technical note was previously produced in 2018 to review the base year, PRTMv1.0, which focused on three areas of the PRTM highway model:

- a review of the model zoning in the vicinity of the Proposed Development;

- a review of the base year coded highway network in the vicinity of the Proposed Development (focussing on M69 Junction 2 and its approaches); and

- a review of the performance of the base year model against observed counts and journey times collected for use in the calibration and validation of the model.

8.29 The PRTM has been enhanced and updated since the previous HNRFI base year model review undertaken in 2018. As part of this enhancement, the PRTMv2.2 has been recalibrated and validated using observed count data and journey times, potentially affecting modelled flows and journey times. The network and zoning around the HNRFI are unchanged materially; therefore, a review of the updated model calibration and validation performance within the PRTMv2.2 in the vicinity of the Proposed Development has been undertaken. The Base Year Model Review report and subsequent addendums describing the work undertaken is appended to the ITA in Appendix 6 (appendix 8.1).

8.30 The Planning and Infrastructure Data presented in the model uncertainty log included within PRTM 2.2 Hinckley core forecast model was reviewed by each of the TWG members for their specific authority areas and by NH in spring 2021. Comments received were reviewed and clarifications provided. The changes and updates related to recent consented developments to be included, planning trajectories, the removal of M1 J19 to J23 smart motorway scheme alongside off-site highway works associated with consented schemes that were still subject to section 106 (s.106) agreements in April 2022. The Planning and Infrastructure data uncertainty log follows the DfT Transport Analysis Guidance (TAG) M4.03 Modelling certainty criteria.

8.31 Following the removal of the Longshoot/Dodwells widening scheme from the Road Investment Strategy 2 (RIS2) in July 2021, NH requested that the core model be updated and forecasting be reviewed and updated for HNRFI. The Planning and Infrastructure uncertainty log has been further revisited and updated in November 2021 and agreed with the TWG, to reflect changes in local planning information (including housing trajectories), updates to certainty levels of some highway network changes and the removal of the RIS2 scheme. A new run of the core forecast model for HNRFI is to be undertaken and results updated for the final ES submission.

8.32 Validation of the PRTM modelling required a number of observed surveys on the surrounding network. This was undertaken in 2018 using video surveys and automatic traffic counts (ATC). The data obtained from these surveys was used in the validation process of the core modelling.

8.33 Collision data has been obtained from LCC and open-source Government data to understand collision patterns. PRoW surveys were undertaken in both 2019 and 2021 to understand the effects of the pandemic on non-motorised users in the vicinity of the Site.

[3] https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/938878/tag-m4-forecasting-and-uncertainty.pdf

Spatial scope

8.34 The spatial scope of the PEIR has been defined using the PRTM model. As set out in the PRTM LMVR (appended to the ITA as Appendix 5 (appendix 8.1)) The PRTM highway network covers all of Great Britain and can be broken down into three distinct areas in-line with TAG Unit M3.1. These are the Area of Detailed Modelling (AoDM) where the level of detail within the network and demand matrices is at its greatest, the rest of the Fully Modelled Area (FMA) where the level of detail is not as great, but capacity restraint is still modelled, and the External Area where the level of detail is at its lowest. The AoDM, where the network and zone detail are at its greatest, was broadly defined as the Leicestershire County boundary but given the expected areas of focus for development in and around the county, further simulation network was included outside Leicestershire to the north, south and west of the county.

8.35 The FMA is defined as Leicestershire and the additional network, where capacity restraint is modelled, to the north, south and west of the county. The PRTM network and zoning across the Midlands are less detailed than in the AoDM but, other than for some town centres, use SATURN buffer speed-flow modelling to provide a feedback process between traffic flows and speeds in the network. Outside the Midlands, buffer links are coded with fixed speeds rather than speed-flow relationships. These fixed speeds vary by time period and modelled year (derived from the DfT's Road Traffic Forecasts).

8.36 To limit the scale and extent of an environmental assessment, the Institute of Environmental Management and Assessment (IEMA), (1993) Guidelines for the Environmental Assessment of Road Traffic (GEART) (GN1) [4] recommend a screening process. The guidelines recommend two thresholds that would normally apply before the environmental effects of increases in traffic need to be looked at in more detail on a specific link.

- Rule 1: Include highway links where traffic flows will increase by more than 30% (or the number of HGVs will increase by more than 30%); and
- Rule 2: Include any other specifically sensitive areas where traffic flows will increase by 10% or more.

8.37 On this basis the following links listed below have been identified to be looked at in more detail when applying either rule 1 or 2. These are detailed in Table 8.5**.**

- B4669 Hinckley Road
- Stanton Lane/Hinckley Road
- B4114 Coventry Road
- Huncote Road/Stanton Lane

[4] https://www.iema.net/resources/event-reports/2020/02/13/iema-impact-assessment-guidance

- The Common/Chapel Street
- M69/A46 south of M69 Junction 2
- A5 east of M69 Junction 1
- Aston Lane/Sharnford Road
- Frolesworth Road

8.38 The Study Area has been taken from the PRTM Area of Detailed Modelling for this review. Data was collected for all key junctions and links in the area around the HNRFI Site encompassing routes into Hinckley, towards Leicester, Nuneaton, Coventry and Birmingham area and to / from the M69 motorway, M1 motorway and the A5 corridor.

8.39 The TA also utilises data from the Area of Detailed Modelling, however the assessment is based on forecast flow changes between the "without development" and "with development (with access infrastructure)" scenarios, for which an Area of Influence is defined. This has been defined by identifying links which are forecast to change by at least 5%, or more than 30 vehicles between the two scenarios or junctions where the Volume over capacity (VoC) is over 85% for 2026 and 2036 AM Peak and PM Peak hour scenarios.

Sensitivity of receptors

8.40 The sensitivity of a road, or the immediate area through which it passes, can be defined by the type of user groups who may use it. Pedestrian, cyclists, motorcyclists, horse riders and other vulnerable road users may include elderly residents and children. It is also necessary to consider footpath and cycle route networks that cross the roads within the Study Area.

8.41 A detailed Geographical Information Systems (GIS) exercise has been undertaken to classify the sensitivity of the routes within the Study Area. For example, if the route passes a school, care home or similar it would have a higher sensitivity due to the presence of vulnerable users.

8.42 The rules are based upon knowledge and experience of environmental effects of traffic and acknowledge that traffic forecasting is not an exact science. The 30% threshold is based upon research and experience of the environmental effects of traffic, with less than a 30% increase generally resulting in imperceptible changes in the environmental effects of traffic. At a simple level, the guidance considers that projected changes in total traffic flow of less than 10% create no discernible environmental effect, hence the second threshold as set out in Rule 2 of GN1.

8.43 The percentage change in traffic flows arising from a development is a function of the level of base flows. In order to prevent very minor changes on links with low baseline flows from being considered more significant, average hourly 24-hour Annual Average Daily Traffic (AADT) flows have been considered. This aligns with the required approach for traffic data to inform the Air Quality documentation with 18-hour Annual Average Weekly

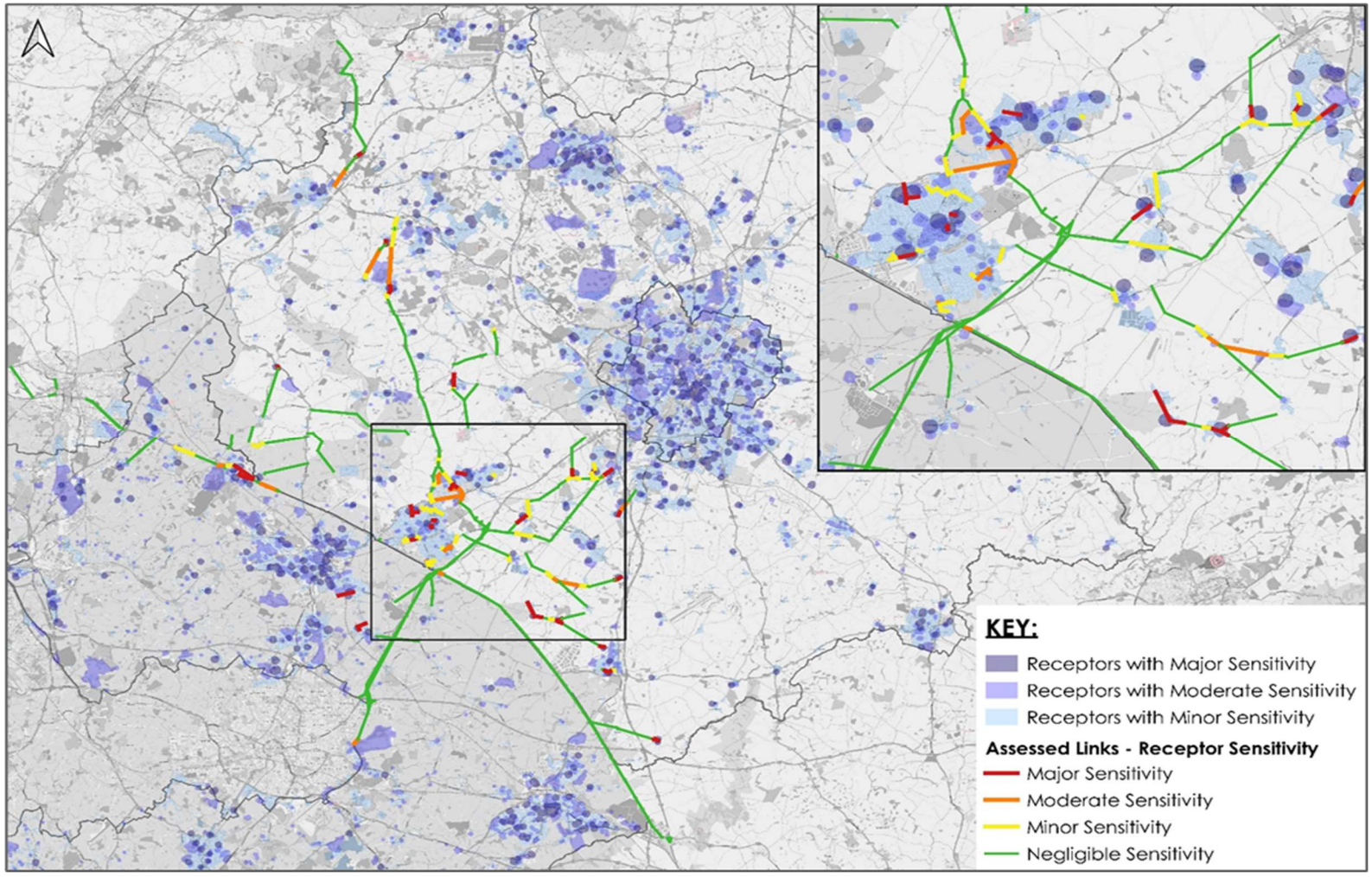
Traffic (AAWT) flows provided for the Noise assessment.

8.44 Table 8.2 sets out the receptor type while Figure 8.1 indicates the sensitive receptors within the Study Area plotted on GIS.

Table 8.2: Transport and traffic - receptor sensitivity

Receptor Sensitivity	Receptor Type
Major	Receptors of greatest sensitivity to traffic flow: schools, colleges, playgrounds, accident blackspots, retirement homes, urban/residential roads without footways that are used frequently by pedestrians
Moderate	Traffic flow sensitive receptors including: doctors' surgeries, hospitals, shopping areas with roadside frontage, roads with narrow footways that are used frequently by pedestrians, unsegregated cycleways, community centres, parks, recreation facilities
Minor	Receptors with some sensitivity to traffic flow: places of worship, public open space, nature conservation areas, listed buildings, tourist attractions and residential areas with adequate footway provision
Negligible	Receptors with low sensitivity to traffic flows and those sufficiently distant from affected roads and junctions

Figure 8.1: Sensitive receptors- GIS Outputs



Assessment criteria

8.45 The key parameters for the Assessment are to quantify the additional traffic from the Proposed Development on the surrounding highway network and assess the effect of the increases in accordance with the GEART (GN1)[5]. The IEMA guidelines identified that: "Previous research has identified that the most discernible environmental impacts of traffic are noise, severance, pedestrian delay and intimidation".

8.46 The environmental impact of the Proposed Development generated traffic has been assessed with reference to GN1[5]. In accordance with the guidance, issues including severance, driver delay, pedestrian amenity and delay, accidents and safety associated with the Proposed Development have been investigated and are reported below.

8.47 Any likely significant environmental effects relating to noise and vibration and air pollution, generated by traffic from the Proposed Development are considered in the relevant technical chapters in this PEIR.

8.48 The assessment methodology adopted in this chapter, is recognised as the industry standard methodology for the assessment of traffic and highway impacts. The guidelines outline the issues and the respective changes in volume and composition of traffic regarded as necessary before each issue results in traffic and transport impacts.

8.49 At this stage of the PEIR, the construction programme for the HNRFI Site has been set out in an indicative programme in Chapter 3 , detail on construction traffic movements will be included for the final submission, including details of material removal, construction traffic management and environmental management. A high level review of likely movements has been carried out to understand impacts ahead of the completion of the Access Infrastructure. Further detail on this information will be included in the Construction Environmental Management Plan (CEMP). The operational assessment assumptions are based on the scenarios modelled with the PRTM. As such this assessment for PEIR is based on the following assessment scenario: Operational Year 2036 With Development.

8.50 The following environmental effects are susceptible to changes because of the Proposed Development.

- Severance: Severance occurs in a community when a major artery separates people from places and other people. Severance occurs from difficulty of crossing a road or where the road itself creates a physical barrier. Severance can be caused to pedestrians or motorists. GN1 suggests that changes in total traffic flow of 30%, 60% and 90% result in slight, moderate and substantial changes in severance respectively.

- Pedestrian/Cycle Amenity: Pedestrian amenity is broadly defined as the relative pleasantness of a journey, and is considered to be affected by traffic flow, traffic composition, pavement width and separation between vehicles and pedestrians. The impact manifests itself in fear and intimidation, exposure to noise and vehicle

[5] https://www.iema.net/resources/event-reports/2020/02/13/iema-impact-assessment-guidance

emissions. GN1 suggests that a doubling or halving of total traffic flow or the HGV composition could lead to perceptible negative or positive impacts upon pedestrian amenity.

- Fear and Intimidation: The volume of traffic and its HGV composition are the factors that contribute to fear and intimidation. In the absence of thresholds set out in the IEA this PEIR considers that changes in total traffic flow of 30%, 60% and 90% are considered to result in slight, moderate or substantial impacts.

- Highway Safety: Highway safety is assessed by the frequency and severity of injury accidents that are attended by the police and recorded in official accident statistics. Intensification of use or changes in the composition of traffic has the potential to have an effect on collision rates. The examination of recent collision statistics on routes within the Study Area will highlight any hotspots that need further examination.

- Driver Delay: The use of industry standard junction capacity modelling programs provides a methodology to quantify junction delay. Driver delay is only likely to be significant where the existing Study Area highway network is at or close to capacity.

Significance criteria

Table 8.3: Significance criteria

Type of Impact	Magnitude of Impact			
	Negligible	Minor	Moderate	Major
Severance	Change in total traffic flow of<30%, 10% in sensitive areas	Change in total traffic 30% to 60%, between 10 % and 30% in sensitive areas	Change in total traffic 60% to 90% between 30 % and 60% in sensitive areas	Change in total traffic 90%+, 60%+ in sensitive areas
Pedestrian and Cycle Amenity	Change in Traffic Flow or HGVs <50%	Change in Traffic Flow or HGVs 50%> to 100%	Change in Traffic Flow or HGVs 100%> to 150%	Change in Traffic Flow or HGVs >150%
Fear and Intimidation	Change in total traffic flow of<30%, 10% in sensitive areas	Change in total traffic 30% to 60%, between 10 % and 30% in sensitive areas	Change in total traffic 60% to 90% between 30 % and 60% in sensitive areas	Change in total traffic 90%+ ,60%+ in sensitive areas
Highway Safety	Magnitude of impact derived using professional judgment informed by the frequency and severity of collisions within the Study Area and the forecast increase in traffic.			
Driver Delay	Magnitude of impact derived using professional judgment informed by the increase in vehicle delay and whether a junction is at, or close to capacity			

8.51 By combining the receptor sensitivity with the magnitude of impact using the assessment matrix shown in Table 8.3, traffic effects are classified as negligible, minor, moderate or major (adverse or beneficial).

8.52 Potential overall significance of traffic effects is a function of both magnitude of the traffic flow increase and the sensitivity of the receptor as shown in Table 8.4. In addition to this, the following parameters need to be considered:

- Duration - for example, whether the impact occurs during a temporary construction period or across the operational period.
- Highway characteristics including road classification, observations of existing traffic and pedestrian flows, road geometries of the highway sections and existing infrastructure.

Table 8.4: Determination of significance

Magnitude	**Major**	Minor	Moderate	Major	Major
	Moderate	Negligible	Minor	Moderate	Major
	Minor	Negligible	Negligible	Minor	Moderate
	Negligible	Negligible	Negligible	Negligible	Minor
		Negligible	**Minor**	**Moderate**	**Major**
		Sensitivity			

8.53 Only moderate and major effects are significant for the purposes of the EIA Regulations; minor and negligible effects are considered 'not significant'.

Duration of effects

8.54 Effects for transport and traffic are typically dependent on whether they are present through construction or operation of the site.

- Operation: Long term, permanent.
- Construction: Short/Medium Term, temporary.
- Operation and Construction Medium term, temporary

Use of the Rochdale Envelope

8.55 The use of the Rochdale Envelope has been adopted to assess the potential environmental impacts of the maximum parameters of the Proposed Development that cannot yet be

fixed. The parameters are described in more detail in Chapter 1; Introduction with other references in Chapter 3 and Chapter 6.

8.56 A worst-case has been assessed for each parameter of the traffic generation including HGVs and light vehicles. This also assists in providing the reference point for the final highway infrastructure design.

Assumptions and limitations

8.57 At the point of submission of the PEIR modelling data has been produced for the operational scenario only. High level construction traffic figures have been reviewed against the phasing plan and likely activity on site during the first two years of construction. However, operational traffic levels, being permanent, long term and connected with distribution represents the worst-case impacts as these will be operational on a 24 hour seven days per week basis. Construction phase impacts will be assessed in the ES accompanying the DCO application, but material excavation and removal from the HNRFI Site is not predicted at this stage, therefore significant savings in off-site construction traffic is likely. Construction trips for similar sites at East Midlands Gateway and Northampton Gateway indicate likely construction vehicle numbers at around 10-15% of the total forecast daily operational traffic flows predicted for the HNRFI Site. The trip rates from these sites have been used to forecast initial construction traffic movements for the earliest phases, when impacts will be most keenly felt on local roads.

8.58 Indicative distribution figures from potential contractors have been provided to understand likely routing of vehicles ahead of the completion of the south facing slip roads and the A47 link road. This estimates around 60% of construction traffic will route from the M69 southbound on the existing slips. The remaining 40% from the B4669 to the west and east of the site access split equally.

8.59 The estimated impacts indicate the vast majority of affected links through Hinckley and the Eastern Villages fall within the 30% Rule 1 threshold for analysis, with absolute HGV numbers below 100 two-way trips per day. Where traffic is above the 30% level; primarily on the B4669 and routes through Hinckley there is likely to be no significant effects on Traffic and Transport due to their short-term nature. However, further assessment will be carried out for the ES with appropriate management measures in place through the CEMP, for impacts to be minimised

8.60 Once the slips are in operation after the first year of construction, followed by the completion of the A47 link, then construction traffic will be focused on the strategic road network to avoid unnecessary impacts on local roads.

8.61 Trip generation data for the site during the operational phase are highly robust and have been ratified by the TWG. These have been forecast from existing distribution sites in the Midlands for HGVs. Car trips have been based on a worst case from Swan Valley which has limited public transport access and is heavily car dependent.

8.62 The traffic outputs for the future years are based on data produced by the PRTM. This model has been constructed using SATURN strategic modelling package and validated

against observed survey information. The package is an assignment model and as such traffic is assigned to different routes across the modelled area based on an algorithm of cost and journey time. As with any large-scale traffic model, limitations exist in the ability to reproduce future year flows.

8.63 Wherever possible, checks and balances have been put in place to ensure the most accurate and up-to-date planning and infrastructure information is used in the model. This has been shared, checked and signed off with the TWG throughout the commissioning process. The model is fully validated and calibrated to DfT TAG 6 Unit M3.1 Highway Assignment Modelling requirements.

8.64 Data outputs from the PRTM model have been mapped into GIS software to show visually the magnitude and location of the change. This has enabled a good level of accuracy in mapping of sensitive receptors. However, there remains a reliance on interpretation and judgement on the extents of the sensitivity.

8.65 Accident statistics have been collated across the Study Area. Given the extents of the area an assessment through COBALT[7] is normally used to measure the impact of the development traffic flows over and above the baseline. This assessment has not been carried out at the time of this PEIR due to the PRTM Forecast core model being revisited, and the software/parameters being withdrawn and updated earlier in 2021 for COBALT. However, it will form part of the final ES and TA submission.

8.66 For this PEIR Chapter, it should be noted that the 2036 'Without Development' model provides traffic flows which includes committed developments, together with consented transport improvement schemes. This committed development traffic is also included within the 2036 'With Development' scenario as well as the Proposed Development (which includes the access infrastructure). The assessment of the effects of the Proposed Development has been carried out by way of a comparison of the changes in traffic between these two scenarios. Therefore, all assessment in this PEIR Chapter includes the cumulative effects.

Highway impact

8.67 The methodology used to forecast the traffic impact of the Proposed Development is based on the surveyed flows and outputs from the PRTM model. As agreed through the TWG meetings three scenarios have been assessed and used as sensitivity tests of impact of possible highway mitigation schemes. The scenarios were as follows for both 2026 and 2036:

- Do Nothing - Without Development (WoD) inclusive of committed development.
- Do Minimum - Without Development With Access Infrastructure (WoDWS).
- Do Something - With Development (WD): including the Access Infrastructure.

[6] https://www.gov.uk/government/publications/webtag-tag-unit-m3-1-highway-assignment-modelling
[7] https://www.tagsoftware.co.uk/COBALT

8.68 Where 'Development' is HNRFI;

8.69 'Access Infrastructure' is:

- M69 Junction 2: New two lane south facing slips (off and on slips) serving Junction 2 are proposed to give direct and all movement access to the Strategic Road Network. The Junction 2 circulatory carriageway is to be widened and existing arms amended. A new roundabout arm will be added for access to the development site. New arms will be provided for the south facing slips onto the M69. All arms of the roundabout are to be signalised.

- A47 Link Road: A distributor road will link Junction 2 of the M69 through the site, crossing the railway and connecting to the B4668 and ultimately the A47. The road is designed as a dual carriageway in the section between the M69 Junction 2 and the site access roundabout 3 (approximately 990 metres) and as a single carriageway between the site access roundabout 3 and the B4668 Leicester Road to the west of the site (approximately 1,500 metres).

- B4668: Provision for three arm new roundabout access to the B4668 Leicester Road, including a segregated left turn lane southbound from the A47.

8.70 The Do Minimum scenario has been tested to understand what flow changes are associated with the redistribution of the existing traffic on the local highway improvements including the M69 Junction 2 and the Link Road.

8.71 'The following years have been assessed:

- 2026 (anticipated first year of occupation);

- 2036 (ten years post-occupation).

8.72 The forecast impacts are judged against the criteria as outlined below.

RELEVANT LAW, POLICY AND GUIDANCE

8.73 This section along with Chapter 5 sets out the national, regional and local policy and legislative background for the Proposed Development relating to transport.

National Transport Policy

National Policy Statement for National Networks NPS (2014)[8]

8.74 The NPSNN provides transport guidance to guide individual development for NSIP brought

[8]https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/387222/npsnn-print.pdf

forward under it.

8.75 The principal aims of the NPS are to deliver (Section 2 Summary):

- networks with the capacity, connectivity and resilience to support national and local economic activity and to facilitate growth and create jobs;
- networks which support and improve journey quality, reliability and safety;
- networks which support the delivery of environmental goals and the move to a low carbon economy; and
- networks which join up our communities and link effectively to each other.

8.76 The NPS (paragraphs 2.42-2.49) also identifies the specific economic and environmental benefits of rail freight Interchanges.

8.77 Specific to HNRFI the NPS states that a TA should be included and produced according to DfT TAG methodology.

National Planning Policy Framework (NPPF) (July 2021)[9]

8.78 NPPF (Section 9) advocates that planning policies and decisions should consider whether:

- the opportunities for sustainable transport modes have been taken up depending upon the nature and location of the HNRFI Site to reduce the need for major transport infrastructure (paragraph 110a);
- safe and suitable access to the HNRFI Site can be achieved for all people (paragraph 110b); and
- improvements can be undertaken within the transport network that cost-effectively limits the significant impacts of the Proposed Development. Development should only be prevented or refused on transport grounds where the residual impacts of development are severe (paragraph 111).

8.79 The NPPF stresses the importance of providing a travel plan for all developments that generate significant amounts of movement (paragraph 113). It also gives priority to provision for low emission vehicles, including in particular the provision of electric car charging facilities (paragraph 112d)

Guidelines for the Environmental Assessment of Road Traffic (GEART), Institute of Environment Assessment[10]

8.80 This document provides the framework for the transport and traffic inputs to an EIA

[9]https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/387222/npsnn-print.pdf

[10] https://www.iema.net/resources/event-reports/2020/02/13/iema-impact-assessment-guidance

document. A standardised list of key effects to be considered is provided in the IEA (now IEMA) documents. This includes the measurement of significance from a matrix of magnitude and sensitivity.

National Planning Legislation

Infrastructure Planning (Environmental Impact Assessment) Regulations 2017[11]

8.81 The process of environmental assessments in the context of town and country planning in England is governed by the Infrastructure Planning (Environmental Impact Assessment) Regulations 2017.

8.82 These regulations set out the procedures to be followed in relation to EIAs linked to NSIP in England and Wales.

8.83 The objective is to provide a high level of protection of the environment and to help integrate environmental considerations into the preparation of proposals for development to reduce their impact on the environment.

8.84 It has been agreed that a detailed EIA will be required in this instance. The DCO application has been formally scoped under the EIA Regulations and this PEIR engages with the points raised.

County Transport Planning Policy

Leicestershire Local Transport Plan (2011-2026)[12]

8.85 The Leicestershire Local Transport Plan 3 (LTP3) seeks to give some certainty to transport planning and policy in developing a strategic framework.

8.86 The LTP recognises that planning policies will be grounded in the reality that most people will wish to own and use cars, but as far as possible, new development will be planned to avoid increasing traffic pressure by ensuring that a choice of attractive alternatives is available.

Leicester & Leicestershire 2050: Our Vision for growth (2018)[13]

8.87 The document prioritises taking advantage of proposals to improve national and regional networks. It recognises Hinckley as a key area for growth.

8.88 The vision for growth includes road and rail improvements within the surrounding area of Leicestershire. This includes key improvements to the M42 motorway, A5, A42 and A46 to expressway standard, which are likely to be fully built out by the early 2030s with increased capacity on the railways proposed within the same timeframes.

[11] https://www.legislation.gov.uk/uksi/2017/572/regulation/4
[12] https://www.leicestershire.gov.uk/roads-and-travel/road-maintenance/local-transport-plan
[13] https://www.llstrategicgrowthplan.org.uk/download/pdf_document/final_plan_docs/Strategic-Growth-Plan-September-2018-Final-for-governance.pdf

Midlands Connect Strategy (2017) [14]

8.89 The Midlands Connect Strategy sets out proposals for achieving the untapped economic potential of the Midlands.

8.90 It also recognises an economic growth corridor between Coventry and Leicester, and a chance to facilitate agglomeration in these areas.

8.91 In addition, it also states that it supports the development of new SRFI proposals, particularly where rail and road access is good.

8.92 A refresh to the strategy is currently underway and a call for input has been published in January 2021, with an updated strategy expected later this year[15].

Enabling progress and facilitating growth – A Rail Strategy for the Midlands 2017 (Network Rail and Midlands Connect)16

8.93 Network Rail and Midlands Connect set out the A Rail Strategy for the Midlands in this document:

"The railways across the Midlands are vital to the region, connecting people to jobs, leisure and goods. This network brings together key locations across the nation for passengers, whilst enabling freight to travel to and from all corners of the country.

By bringing people to jobs and businesses to markets, the Midlands' railways play a key role in supporting economic growth. This document outlines an industry developed strategy to both facilitate and accommodate growth for the next 10 to 30 years, which has been supported and endorsed by Midlands Connect."

"More Freight: Key flows for the Midlands include intermodal container traffic from Felixstowe ports to the West Midlands and transfer of construction materials from Peak District quarries to London. This positive demand is projected to continue in the future" and then states that "The Midlands forms a critical hub for the national freight network"

Local Transport Planning Policy

Blaby Development Plan (including Blaby District Local Plan (Core Strategy) 2013 [17] ***and Blaby District Local Plan (Delivery) DPD 2019)***[18]

8.94 The Core Strategy sets out the overarching strategy and core policies to guide future development in the district up to 2029.

8.95 It recognises that 'One of the key obstacles affecting the economic success of the District

[14] https://www.midlandsconnect.uk/publications/midlands-connect-strategy-march-2017/
[15] https://www.midlandsconnect.uk/media/1738/strategy-refresh-summary-document-final.pdf
[16] https://cdn.networkrail.co.uk/wp-content/uploads/2017/08/Midlands-Strategy-Summary-document.pdf
[17] https://www.blaby.gov.uk/planning-and-building/local-plan/local-plan-core-strategy/
[18] https://www.blaby.gov.uk/planning-and-building/local-plan/local-plan-delivery-dpd/

is its transport network.' (Paragraph 4.18).

8.96 A key policy aim is to 'deliver the transport needs of the District and to encourage and develop the use of more sustainable forms of transport' (section 5).

8.97 With regard to rail freight enhancements Policy CS10 of the Core Strategy states:

8.98 'Within strategic (including national and regional) and financial constraints, BDC will support the exploration of realistic opportunities for improving rail-based movement of goods and people'.

8.99 Development Management Policy (DM7) Road Related Facilities for HGVs states: 'Major development proposals that include mainly B8 uses will include provision, of an appropriate scale, for road related facilities for HGV drivers, including toilets and secure parking, within the development site'

Hinckley and Bosworth Local Development Framework 2009 Core Strategy[19]

8.100 Whilst the Main HNRFI Site is situated within the BDC administrative boundary, with a small section within HBBC boundary, the traffic impacts have potential to occur off-site and across neighbouring authorities. For this reason it is considered pertinent to consider the Hinckley and Bosworth Development Plan.

8.101 The Core Strategy sets out the overarching strategy and core policies to guide the future development of the borough up to 2026.

8.102 The local plan is gradually being replaced by Development Plan Documents (DPDs) which form part of the Local Development Framework (LDF). The majority of the Local Plan Policies from the 2006 local plan have been saved until they are replaced by policies in the DPDs.

8.103 The primary spatial objective for transportation and the need to travel reads:

'To reduce the high reliance on car travel in the borough and to increase the opportunities for other forms of transport by focusing the majority of development in the Hinckley urban area where there is a range of transport options available and through securing improvement to public transport infrastructure and facilities that promote walking and cycling and through the use of travel plans.'

Harborough Local Development Framework 2011 Core Strategy[20]

8.104 Off-site mitigation works are proposed at the Cross-in-Hand Roundabout and therefore due consideration of the Harborough and Rugby Local Plans has been taken.

8.105 Policy CS5 highlights that; *all significant development proposals should provide for coordinated delivery of transport improvements as outlined in the place-based*

[19] https://www.hinckley-bosworth.gov.uk/download/downloads/id/487/core_strategy_adopted_document.pdf
[20] https://www.harborough.gov.uk/downloads/file/17/core_strategy

policies (Policies CS13-CS17) of this Strategy as further informed by detailed application of the Leicester and Leicestershire Integrated Transport Model

Rugby Local Plan 2011[21]

8.106 As for Harborough, Rugby orders the off-site improvements at the Cross-in-Hand key policy sections are identified below.

8.107 Policy DC5, Comprehensive Development of Strategic sites states; *Further on-site and off-site measures to mitigate transport impact as detailed in the Infrastructure Delivery Plan, including access to the local road network as deemed necessary through the Transport Assessment and agreed by Warwickshire County Council and the Highways Agency.*

Additional Transport Planning Guidance

Design Manual for Roads and Bridges[22] ***(DMRB)***

8.108 The DMRB provides guidance as to the requirements to the environmental assessment (LA 101) for larger development schemes.

Manual for Streets 2[23]

8.109 Manual for Streets 2 (MfS2) - Wider Application of the Principles, is a companion guide to MfS and builds on the philosophies set out in MfS and demonstrates how they can be extended beyond residential streets.

Leicestershire Highway Design Guide[24]

8.110 Part 3 of the Leicestershire Highway Design Guide is intended to help design development layouts that provide safe and free movement for all road users, including cars, lorries, pedestrians, cyclists, and public transport.

8.111 It provides guidance on 'the overall development concept in terms of site access and highways and transportation impacts' and sets out the car parking and servicing requirements for new developments.

8.112 This guidance as well as operational requirements will be considered in developing the highways and transportation strategy for the proposal.

Relevant Transport Related National Decarbonisation Plans

Decarbonising Transport: A Better, Greener Britain, Department for Transport, July

[21] https://www.rugby.gov.uk/downloads/file/2319/local_plan_2011-31
[22] https://www.standardsforhighways.co.uk/dmrb/
[23] https://tsrgd.co.uk/pdf/mfs/mfs2.pdf
[24] https://resources.leicestershire.gov.uk/environment-and-planning/planning/leicestershire-highway-design-guide

2021[25]

8.113 This plan sets out the government's commitments and the actions needed to decarbonise the entire transport system in the UK. It includes:

- a pathway to net zero transport in the UK;
- the wider benefits net zero transport can deliver; and
- the principles that underpin the approach to delivering net zero transport.

8.114 The plan follows on from 'Decarbonising transport: setting the challenge', published in March 2020 (now withdrawn), which laid out the scale of additional reductions needed to deliver transport's contribution to legally binding carbon budgets and delivering net zero by 2050.

Net zero highways: our 2030/ 2040 / 2050 plan – National Highways, July 2021[26]

8.115 NH has announced its ambitious new carbon plan that will see it rapidly cut carbon from road construction, maintenance, and operations, and support the transition to zero emission vehicles.

8.116 NH plans to achieve this by putting roads at the heart of Britain's net zero future through three key commitments; achieving net zero for its own operations by 2030, delivering net zero road maintenance and construction by 2040; and supporting net zero carbon travel on our roads by 2050.

8.117 Contractors and suppliers will also be required to act, including commitments to reduce carbon year-on-year by using the latest technologies, so that by 2040 our road maintenance and construction is near zero emissions.

BASELINE CONDITIONS

Highway Network

8.118 The following section describes the strategic and local highway network within the vicinity of the HNRFI Site and the accessibility of the HNRFI Site for road-based movements.

8.119 The highway network can be broadly categorised as the 'Strategic Road Network' (SRN) (which consists of motorways and trunk roads) and the 'local highway network'. It is the responsibility of NH to operate, maintain and improve the SRN, and likewise LCC, LCiC and WCC in respect of the local highway network. A summary of the pertinent roads/highways

[25]https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1009448/decarbonising-transport-a-better-greener-britain.pdf
[26] https://highwaysengland.co.uk/media/eispcjem/net-zero-highways-our-2030-2040-2050-plan.pdf

and their respective categorisation is summarised below.

Strategic Road Network: Motorways and Trunk Roads

8.120 The HNRFI Site is currently well served by road as well as rail, with direct access onto the M69 motorway via Junction 2 and thereafter the wider SRN as set-out below:

M69 Motorway

8.121 The M69 motorway affords the HNRFI Site with an immediate connection to the strategic road network, which runs directly adjacent to the southeast of the HNRFI Site. A new access serving the HNRFI Site directly onto Junction 2 is to be created.

8.122 To the south the M69 motorway connects with the A5 at Junction 1, the M6 at Junction 2/ Junction 0 of M69 and A46 on the outskirts of Coventry and to the north it connects with Junction 21 of the M1 on the outskirts of Leicester.

8.123 M69 Junction 2 currently only has northern facing slip roads (northbound on-slip, and southbound off-slip). As part of the Proposed Development access strategy, it is proposed to deliver a strategic improvement by delivering the southern facing slip roads (southbound on-slip, and northbound off-slip). It is therefore considered that the sensitivity of the M69 motorway is negligible.

M6 Motorway

8.124 The M6 motorway is a major arterial route in the western side of England. To the east it provides a link to the M1 and Kettering (via the A14) and to the north with the A74 (M) at Carlisle (196 miles/316km).

8.125 The M6 continues onto the key regional conurbations of Birmingham (26 miles/42km) and Manchester (84 miles/135km). It is therefore considered that the sensitivity of the M6 is negligible.

M1 Motorway

8.126 The M1 is another key arterial route which runs up the central spine of England. To the south it provides a link to London (96 miles/154km) and to the north it links with Leeds (98 miles/158km).

8.127 The M1 continues onto the key regional conurbations of Nottingham (35 miles/56km) to the north and Northampton (33 miles/52km) to the south. It is therefore considered that the sensitivity of the M1 is negligible.

A5 Watling Street

8.128 The A5 trunk road acts as a key north – south link between the M42/Tamworth and the M1/M45/Milton Keynes.

8.129 The A5 is a single carriageway road within the vicinity of Hinckley. To the north of the M69

motorway the road is subject to a speed limit of 40mph/64kph and to the south it is subject to a speed limit of 60mph/96kph (national speed limit).

8.130 Around 2 miles/3.2km to the south of the M69 motorway the A5 turns into a dual carriageway.

8.131 To the north the A5 provides access from the M69 motorway to the recently developed Hinckley Park.

8.132 NH have a committed RIS2 (Road Investment Strategy)[27], with funding available during the RP2 (Second Road Period, covering 2020/21 to 2014/25), from which the Longshoot/Dodwell widening scheme has now been cancelled in the July 2021 Delivery Plan update[28]. The A5 Partnership are continuing to progress the development of the A5 corridor study[29] and the update to the Delivery Plan acknowledged that NH are looking at the A5 Hinckley to Tamworth RIS 3 pipeline proposals in which Longshoot/Dodwell will be considered. It is therefore considered that the sensitivity of the A5 is expected to be minor, until any definitive proposals come forward for the A5 around Hinckley.

A5 Watling Street Railway Bridge

8.133 The bridge is located on the A5 Watling Street, between M69 Junction 1 (M69 J1) and the A47 Dodwells Roundabout, near Hinckley. The bridge is owned and maintained by Network Rail and is located on the Felixstowe to Nuneaton line, which links Birmingham, Leicester, Peterborough via Nuneaton, and Oakham. Network Rail, as owners of the bridge, facilitate the installation of traffic signs on the structure itself. NH are responsible for the provision of traffic signs on the A5 in advance of the bridge. Bridges with headroom of less than 16'6" (5.03m) are classed as 'low bridges'. These must be signed to identify the maximum height of a vehicle that can safely pass on the carriageway under the bridge. With a headroom clearance of 15' (4.6metres) the A5 Watling Street bridge is classed as a 'low bridge'. The A5 serves as a major Freight Corridor for Logistics developments along its length and a number of high sided vehicles strike the bridge each year therefore the sensitivity of the bridge is moderate.

Local Highway Network

8.134 Access to the HNRFI Site is to be derived directly from M69 Junction 2, and the introduction of southern slip roads ensures that the SRN can be fully utilised for travel to and from the HNRFI Site. Nonetheless, a comprehensive assessment of the local highway network is being undertaken, and this section describes the local highway network within the vicinity of the HNRFI Site.

[27] https://www.gov.uk/government/publications/road-investment-strategy-2-ris2-2020-to-2025
[28] https://nationalhighways.co.uk/media/bz3kjnck/delivery-plan-update-2021-22_final-web-version-1.pdf
[29] https://hinckleybosworth-my.sharepoint.com/:b:/g/personal/a5partnership_hinckleybosworth_onmicrosoft_com/EZwoonO3o4RJvJpvSLoSapwB_ATHoPikWCYvITSD8oOP-Q?e=2STlJA

B4669 Sapcote Rd/Hinckley Road

8.135 The B4669 runs in an east-west alignment immediately south of the HNRFI Site and forms a grade-separated junction with the M69 Junction 2.

8.136 To the west the B4669 Sapcote Road provides a connection into Hinckley and to the east the B4669 Hinckley Road provides connections to the villages of Sapcote and Stoney Stanton.

8.137 The B4669 is a single carriageway road and within the vicinity of the HNRFI Site is subject to the national speed limit (60mph/96kph). On entry to the urban area of Hinckley this reduces to 40mph/64kph and then 30mph/48kph.

8.138 In the urban area of Hinckley there is generally footway provision on both sides of the road, and in the vicinity of the HNRFI Site a footway on the northern side of the carriageway links Hinckley with M69 Junction 2. The carriageway is generally well lit in the urban area of Hinckley and at key junctions but is generally unlit in the rural environment between Hinckley and M69 Junction 2. Access to Smithy Lane is taken from the B4669, providing access to Burbage Common and the traveller site to the north.

8.139 To the east of M69 Junction 2 the B4669 provides a connection with the village of Sapcote and the B4114 Coventry Road to the south.

8.140 In this location the road is generally rural in nature and is subject to a 50mph speed limit. When the road enters the village of Sapcote the speed limit reduces to 30mph. Footway provision is generally provided on both sides of the carriageway within the urban area of Sapcote. In Sapcote and at key junctions, the carriageway is lit. However, in the rural settings the carriageway is generally unlit. It is therefore considered that the sensitivity of the B4669 is minor.

B581 Station Road

8.141 The B581 runs from the A47 and the village of Barwell to the village of Stoney Stanton passing over the M69 motorway.

8.142 The road is primarily rural in nature with some intermittent residential frontage. It is subject to a 40mph speed limit to the north of the M69 motorway, the national speed limit (60mph) to the south of the M69 motorway and 30mph within the village of Stoney Stanton.

8.143 It is proposed to provide emergency vehicle access to the HNRFI Site via Burbage Common Road or via a connection with Hinckley Road/B4669 to the south of the HNRFI Site. It is therefore considered that the sensitivity of the B581 is minor.

A47

8.144 The A47 is a major road which runs along the northern boundary of Hinckley. This is likely to act as a local route for vehicular movements accessing the HNRFI Site from the surrounding area which are not as well connected to the SRN. This would include villages

such as Barwell and Kirkby Mallory and industrial sites such as the Caterpillar UK Ltd plant in the village of Peckleton.

8.145 To the west the A47 connects with the A5 and Nuneaton, with Leicester City Centre to the east.

8.146 Within the area of Hinckley, the A47 is a 9 metre wide single carriageway road with no direct frontage. It has a segregated walking and cycling route on its southern boundary.

8.147 The A47 connects with amongst others the B4666, Stoke Road, B4667, B4668 and B581 via either roundabout or signalised junctions. It is therefore considered that the sensitivity of the A47 is minor.

B4668 Leicester Road

8.148 The B4668 links the A47 with Hinckley Town Centre and passes Burbage Common. The road then continues into Hinckley where it is directly fronted by residential properties.

8.149 The B4668 is a single carriageway road with a minimum width of around 8 metres. It is generally well lit and has footway provision on both sides of the carriageway within the urban area.

8.150 Within Hinckley the road is subject to a 30mph speed limit. Outside the urban area the speed limit increases to 40mph and then 60mph. No weight or height restrictions are in place along the road. It is therefore considered that the sensitivity of the B4668 is minor.

Burbage Common Road

8.151 Burbage Common Road is a rural lane which links the B4668 and the B581 passing through the northern part of the HNRFI Site.

8.152 The majority of the carriageway consists of a single track lane (3m wide) with intermittent passing places. It is primarily fronted by open fields with the occasional residential property and Woodhouse Farm butchery. It is unlit and pedestrians/vehicles share the space.

8.153 On the northern boundary of the HNRFI Site it passes over the Felixstowe to Nuneaton railway via a railway bridge.

8.154 It is proposed that as part of the Proposed Development Burbage Common Road will be stopped-up within the HNRFI Site boundary, with access to the HNRFI Site being retained for emergency vehicles as well as pedestrians, cyclists and equestrians.

8.155 Access will be retained for existing properties along Burbage Common Road outside the limits of the DCO. Through movements, and those to and from the HNRFI Site, will be restricted. It is therefore considered that the sensitivity of Burbage Common Road is moderate.

B4114 Coventry Road

8.156 The B4114 is an arterial road to the south of the HNRFI Site. It connects with the A5 to the west via a complex priority junction and to the east with the outskirts of Leicester and M1 Junction 21.

8.157 The B4114 provides access to a number of villages along the route including Sharnford, , Croft, Cosby, Littlethorpe, Sapcote, Stoney Stanton, Broughton Astley and Narborough.

8.158 The road is generally a single carriageway road except for a small section within the vicinity of the village of Croft which widens to a dual carriageway with a central reservation.

8.159 Where there is no direct frontage to the carriageway it is generally unlit with no footway provision. Where the road passes through the villages of Sharnford and Narborough the road is generally well lit with footway provision in place.

8.160 The speed limit along the road varies from 30mph/48kph to 70mph/112kph national speed limit. There are no weight limit restrictions on the road with various lay-bys along the side of the carriageway. It is therefore considered that the sensitivity of the B4114 is minor.

Vehicular access

8.161 The Proposed Development is situated in a highly accessible location and is extremely well served by the road as well as rail, with direct access onto the M69 motorway via Junction 2 and thereafter the wider SRN.

8.162 M69 Junction 2 is a grade separated roundabout connecting the M69 motorway and the B4669 Hinckley Road. The capacity of the junction is high. With flows through the junction being relatively low, there is residual capacity to accommodate a significant increase in movements.

8.163 The junction currently only has northern slip roads (northbound-on, southbound-off) and the Proposed Development will deliver the southern slip roads (southbound-on, northbound-off) and make the junction an ‘all-movements’ junction.

8.164 The introduction of southern slip roads enables development traffic to travel along its desire line and acts to distribute traffic more effectively across the junction and the wider SRN – minimising the potential impact the HNRFI Site may otherwise have on the local highway network.

8.165 The HNRFI Site access would be created directly onto the north-western side of Junction 2 via a dual-carriageway connection to the junction and extending into the HNRFI Site.

8.166 The A47 Main Site will link M69 Junction 2 of the M69 motorway through the HNRFI Site, crossing the railway and connecting to the B4668 and ultimately the A47 to the north-west.

Rail

8.167 The baseline operations on the rail network have been reviewed for the HNRFI operations and data has been taken from the real-time train website to provide a baseline condition for the purposes of this PEIR Chapter. The average number of daily trains through Hinckley Rail Station have been taken as these trains will have passed the HNRFI site of which there are 79 made up of the following:

- 37 Freight Trains; and
- 42 timetabled passenger trains.

8.168 The use of rail freight will depend on a number of key variables, with success related to ease of access to the mainline and economic viability, which is not purely distance related. Rail equipment utilisation is a crucial part of the economics of operating viable rail freight services. Intensive use over relatively short distance works, as does long haul freight.

8.169 The HNRFI is exceptionally well located in this context, being on the relatively recently upgraded Felixstowe to Nuneaton mainline designed particularly to serve the deep-sea port of Felixstowe, also benefitting London Gateway, Liverpool and Southampton, saving them from having to use the North London line and the more congested pathways of the West Coast Mainline, south of Nuneaton. It is gauge cleared to carry the highest 9'6" containers.

8.170 The HNRFI is in close proximity to the manufacturing core of the West Midlands. From the outset DIRFT was seen as prime for Fast Moving Consumer Goods; and Hams Hall for heavier engineering. HNRFI is uniquely positioned to serve both, as expressed in the Leicester & Leicestershire Local Economic Partnership plan for the area.

8.171 The onward distribution from Hinckley occupiers is anticipated for modelling purposes to be via road to national, regional and local destinations, either to manufacturers, retailers or end users. Some products may have their secondary movement out undertaken by rail to other regions, including Scotland. This maybe to go through a regional distribution centre (RDC) elsewhere or to other major manufacturing centres, particularly in the North West and the North East. This would save lorry movements, but for forecasting purposes has not been assumed at this juncture.

Non-motorised users

Public Rights of Way

8.172 There is an extensive network of public rights of way ('PRoW') routes running through the HNRFI Site as detailed in Chapter 11, Appendix 11.2 Public Rights of Way, Appraisal and Strategy and shown in Figure 11.3.

8.173 There are sections of five footpaths (U50, U52, U53, V23 and V35) and two bridleways (U52 and V29) within the site. Bridleway U51 is also present along the south-western site boundary.

8.174 On-site PRoWs facilitate access in most directions. Six of these paths extend or have connections beyond the boundary of the site and include:

- To the north – T89/1, T89/2, U50/3 and U50/4;
- To the south – U50/1, V35/1, V29/8 and V30/4;
- To the east – V29/6, V29/4, V29/9, U53/2 and V29/3; and
- To the west – U52/8 and U52/6. .

Pedestrian access

8.175 The B581 and the B4668, which are located at either end of Burbage Common Road, both have footways running alongside their carriageways.

8.176 Both the B4469 Hinckley Road and M69 Junction 2 have footways on the northern side of the carriageway. The M69 motorway entry and exit slip roads are crossed via uncontrolled crossings.

8.177 The existing railway in the vicinity of the site features a series of uncontrolled gated pedestrian level crossings serving local PROW routes. These include level crossings at the following locationsas set out within the Site Description (chapter 3) and listed in below.

- Thorney Fields Farm No 2 Footpath No. U17/1, 1 km NW of Sapcote
- Elmesthorpe: Footpath No. T89/1 between Bostock Close and the B581 Station Road, opposite the Wentworth Arms public house
- Earl Shilton: Footpath No: U50/3 connecting Elmesthorpe to the north with Burbage Common Road
- Barwell: Footpath No. V23/1, Connecting the Elmesthorpe-Burbage Common Bridleway (U52/9) with Burbage Common Road to the east of the railway.
- The Outwoods: Footpath no. U8/1, connecting Burbage and the Hinckley Academy and John Cleveland Sixth Form Centre in Hinckley.

Cycling access

8.178 Although there is some cycle infrastructure in place in the area, the access to the HNRFI Site is currently limited with no dedicated cycle facilities in the immediate vicinity of the HNRFI Site. The existing network can be seen in Figure 7 of the ITA (appendix 8.1).

8.179 However, the A47 benefits from cycle infrastructure. From the A5 through to the roundabout with Leicester Road (north of Earl Shilton), there is a shared footway/cycleway adjacent to the road. To the north of that roundabout there are on-road cycle lanes. Cycling on-road is considered a genuine option given the travel distances from nearby residential areas.

8.180 A cycle route to Hinckley is provided along the A47 on the northern edge of town to the roundabout with the B4668.

8.181 Cycle routes from Leicester are of high quality but terminate in Narborough. Leicester city centre can be accessed either via off-road National Cycle Network (NCN) route 6 or via a local cycle route 3 along Narborough Road. Additionally, as the local cycle route 4 runs adjacent to the city ring road, other parts of the city can be also easily accessed by bike. To get to the City from the site cyclists can utilise the A47 and go via Enderby to Narborough and or the B4114 to the south or go via local cycle routes to the north west.

FUTURE BASELINE

Construction phasing, traffic and PROW

8.182 The current estimated construction programme start is for Quarter 1 2025 subject to consents and investment decisions. First occupation on a phased approach is anticipated for 2026.

8.183 The pace of development will broadly reflect occupier demand. Subject to the demands of the property market it is anticipated that the above works would be phased over a total period of 10years. The construction phasing is based upon the commitment to deliver significant infrastructure development early in the process prior to the first occupation of the warehousing units.

8.184 The indicative construction programme is set out in Chapter 3, Table 3.4. It is proposed that development would take place in phases with floorspace thresholds or triggers specified for the completion of off-site highways works and elements of the Railport.

8.185 As set out in the Public Rights of Way Appraisal and Strategy Appendix 11.2 Table 5.1, the greatest disruption to the PRoW network will occur during construction phase when, particularly for routes within the centre of the site, routes would be closed to allow for site clearance and construction works to proceed safely.

Baseline traffic flows

8.186 The baseline traffic flows on the road network are projected to increase year on year. The operational scenario post full completion will represent a worst-case in terms of traffic generation. A horizon year of 2036 has been applied to the PRTM modelling outputs, this is ten years post first projected occupation and two years prior to the Blaby Local Plan Period.

8.187 Growth applied is based on National Trip End Model (NTEM) forecasts which have been adjusted to include planning allocations with high degrees of certainty as defined by TAG guidance. The following section lists the largest allocated and committed developments.

8.188 Baseline traffic flows are included within Table 8.5, under 2036 Without Development.

A5 Watling Street Railway Bridge

8.189 Whilst the HGV traffic associated with the intermodal terminal itself won't affect the bridge as a standard height container loaded HGV is a maximum of 4.42m metres, the distribution warehouses occupiers may operate high sided vehicles and with that in mind the HGV Management Plan & Strategy outlined in the Proposed Mitigation section sets out the actions that will take place to ensure heights are monitored and HGV's rerouted where applicable. High sided vehicles form less than 3% of the HGV's on the existing highway network.

Committed developments

8.190 Known committed developments in the vicinity of the HNRFI Site have been included in the PRTM Core Forecast model for the HNRFI assessments undertaken within this Chapter. This captures the anticipated traffic growth in the area from planning and infrastructure information agreed with the TWG in the form of an Uncertainty Log (UL).

8.191 The Planning and Infrastructure Data presented in the model UL included within PRTM 2.2 Hinckley core forecast model was reviewed by each of the TWG members for their specific authority areas and by NH in spring 2021. Comments received were reviewed and clarifications provided. The changes and updates related to recent consented developments to be included, planning trajectories, the removal of M1 J19 to J23 smart motorway scheme alongside off-site highway works associated with consented schemes that were still subject to section 106 (s.106) agreements in April 2021. The Planning and Infrastructure data uncertainty log follows the DfT TAG M4.030 Modelling certainty criteria.

8.192 Following the removal of the Longshoots/Dodwells widening scheme from the Road Investment Strategy 2 (RIS2) in July 2021, NH requested that the core model be updated and forecasting be reviewed and updated for HNRFI. The Planning and Infrastructure uncertainty log has been further revisited and updated in November 2021 and agreed with the TWG, to reflect changes in local planning information (including housing trajectories), updates to certainty levels of some highway network changes and the removal of the RIS2 scheme. A new run of the core forecast model for HNRFI is to be undertaken and results updated for the final ES submission.

8.193 Whilst this assessment for the PEIR is based on the July Forecast HNRFI Core Model outputs as reported in PRTMV2.2 Hinckley NRFI application: Forecast Modelling Report dated July 2021 which can be found in ITA Appendix 8.1**,** the ES accompanying the DCO application submission will be updated with results of the new model run incorporating the updated UL and additional Base Model review.

8.194 The detailed UL is confidential, however a summary of strategic sites and schemes that were included in the July model are provided within Appendix A and B of the Forecast

[30]https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/938878/tag-m4-forecasting-and-uncertainty.pdf

Modelling Report in ITA Appendix 8.1.

8.195 Highway Infrastructure developments include the following:

- A new roundabout on A5 and M69 Junction 1 improvements associated with Land East of J1 of the M69 motorway;
- Frank Whittle Roundabout/A4303 and A5 Gibbet Lane Roundabout localised widening and enhancements associated with Magna Park and Lutterworth East;
- Hinckley, Rugby Road Corridor Improvements – Phase 4 Hinckley Town Centre Improvements;
- The SMART motorways scheme for M1 Junction 19-23A was removed from the PRTM 2.1/2.2 model runs at the request of NH.
- The Longshoot Dodwells widening scheme (Formerly RIS2) will be removed from the next model run of PRTM 2.2 HNRFI Core at the request of NH.

Rail Terminal

8.196 The onward distribution from Hinckley warehousing occupiers is anticipated for modelling purposes to be via road to national, regional and local destinations, either to manufacturers, retailers or end users. Some products may have their secondary movement out undertaken by rail to other regions, including Scotland. This maybe to go through a regional distribution centre (RDC) elsewhere or to other major manufacturing centres, particularly in the North West and the North East. This would save lorry movements, but for forecasting purposes has not been assumed at this juncture.

8.197 The HNRFI has been designed such that when fully developed out, the terminal will be able to accommodate up to 16 trains per day. It is proposed to have the ability to deliver mainline access at both the eastern and western end of the HNRFI Site, with crossovers, allowing rail services to enter and depart from the HNRFI Site in either direction.

8.198 The total HGV movements off-site have been calculated based on the container numbers and the maximum 16 paths per weekday and 4 train paths per weekend day. A train path is the infrastructure capacity needed to run a train between two places over a given time-period.

8.199 This level of service is already contained within Network Rail's rail freight growth forecast through this route. As such HNRFI is designed to provide the terminal capacity needed to help achieve this anticipated growth.

8.200 As forecast growth, these rail freight services are already built into the long-term forecast used to plan additional passenger and freight services to and from the West Midlands to and through Leicester. As such it is understood that the rail freight traffic will not conflict with the planned development of additional passenger services on this line or existing timetabled passenger services.

8.201 Ongoing consultation with Network Rail has confirmed that adequate capacity is available within the network. However, limitations do exist around busy periods. For the DCO application a full rail capacity assessment by WSP/Baker Rose will be submitted.

POTENTIAL SIGNIFICANT ENVIRONMENTAL EFFECTS OF THE PROPOSALS

Introduction

8.202 The following section provides a summary of potential significant environmental effects of the proposals specific to Transport. This takes the Operational phase as a worst case assessment for all criteria.

8.203 As discussed in the Assumptions and Limitations section, construction traffic is considered at high level within the PEIR. A review of the trips generated in the preliminary phases of the construction has been carried out. This is prior to the construction of the access infrastructure to the site and therefore places most pressure on the local road network.

8.204 The figures indicate absolute HGV numbers on local road networks as below 100 two-way movements which in percentage terms in generally below the Rule 1 30% threshold on most routes. There are some links which will be above this, where baseline HGV traffic is low, these routes include roads in the centre of Hinckley and the B4669 immediately east of Junction 2 M69. However, there will be no likely significant effects on traffic and transport due to their temporary short-term nature. Operational impacts have been assessed and are forecast to be significantly higher than construction traffic flows. However, for the ES this section will include further analysis in relation to Construction Traffic:

- Estimates of construction traffic for each phase;
- Impacts on the existing network as a result of construction activity;
- Impacts on the rail network due to construction; and
- Impacts due to mitigation works.

Public transport

8.205 The overall provision of public transport will be improved to serve the Proposed Development and secured through a the DCO and / or Section 106 Agreement. A public transport strategy has been submitted as part of a Draft Sustainable Transport Strategy (STS), to be included as an appendix to the final TA.

It is proposed to enhance existing services to key employee locations such as Coventry, Leicester, Hinckley and Nuneaton as well as develop demand responsive bus transport to local villages to the east of the M69 motorway. This increase in public transport provision and the proposals set out in the STS and Framework Site Wide Travel Plan (FSWTP) have not been accounted for in the operational assessment and are considered further in the

Mitigation and Residual Effects section of this PEIR Chapter. The review of the proposals will be influenced by responses to the statutory consultation exercise.

Walking and cycling

8.206 Impacts on walking and cycling routes will include some level of severance where road traffic levels increase, though this will be offset with the new infrastructure provided. Paragraph 8.204 provides further detail on Pedestrian and Cycling Amenity. Off-site, additional infrastructure is proposed on the surrounding highway network and this has been considered in the operation assessment of amenity for pedestrians cyclists and equestrians. Further details on this will provided in the final submission TA and the Walking, Cycling and Horse Riding Review (WCHAR)- which is subject to feedback from the consultation process.

8.207 As set out in the Public Rights of Way Appraisal and Strategy Appendix 11.2, routes within the site would be subject to closure, particularly bridleways, these include; U52/6 and U52/7 as permanent closure and V35/2, V29/6-8 and U52/8 as temporary during construction. However, where possible footpaths will be accommodated within the development and where this is done, although the character of these routes would change considerably, the access provision across the site would remain. For bridleways, as there is no opportunity for access across the railway line beyond the existing crossing point on Burbage Common Road, a new route is to be created around the eastern and southern boundaries, being located within a new, and generous, green corridor.

8.208 Two level crossings within the site boundary will be closed; the first on Footpath No: U50/3 connecting Elmesthorpe to the north with Burbage Common Road and second on Footpath No. V23/1, connecting the Elmesthorpe-Burbage Common Bridleway (U52/9) with Burbage Common Road to the east of the railway.

8.209 From an operational perspective, the PRoW network within the Project Site will benefit from a series of upgrades, re-routing, resurfacing and access review improving the user experience and additional provision for cyclists extending the range of users and off-site connections. Again, this is set out in the Public Rights of Way Appraisal and Strategy Appendix 11.2.

Operational highway impact

8.210 With the Proposed Development (M69 Junction 2 A47 Link Road) in place but with no mitigation (i.e. WD scenario) increase in flow of 30% or more (or 10% or more in sensitive locations) will occur at the links listed below in

8.211 Table 8.5.

8.212 Receptors with increased sensitivity have been identified in line with the conditions set out in

8.213 Table 8.2. The areas and affected links are shown Figure 8.2.

8.214

8.215 Table 8.5 provides an overview of links that are required to be assessed in line with Rule 1 and Rule 2 as set out in Paragraph 8.3.2.

8.216 All operational effects reported are permanent, long-term.

Table 8.5: Highway impact

Road	Location	Near to Sensitive Receptors	AADT Total Vehicles			AADT HGV's			Magnitude of Change Criteria	Significance of Traffic Effects
			2036 Without Development	2036 With Development	% Change	2036 Without Development	2036 With Development	% Change		
B4668 Leicester Road	A47 Link Road	Yes	19575	26022	32.9	6	1195	19583	Major	Major
Main Road	Claybrooke Magna	Yes	582	1344	131.1	0	0	0.0	Major	Major
A47	East of junction with A447	No	17065	18670	9.4	856	1703	99.0	Major	Moderate
B4669 Hinckley Road	Sapcote (between Stanton Lane and Sharnford Road)	No	6275	11995	91.2	166	558	236.4	Major	Moderate
B4669 East of M69 J2	Eastern villages-west of Stanton Lane Sapcote	No	10399	20979	101.7	322	700	117.1	Major	Minor
Stanton Lane/Hinckley Road	Stoney Stanton	No	3751	8610	129.6	141	130	-7.7	Major	Minor
B4669 Leicester Road	East of Sapcote	No	4953	9165	85.1	59	440	641.9	Major	Minor
Hinckley Road	Aston Flamville	No	1262	2417	91.6	38	54	43.3	Major	Minor
Leire Road	South of Broughton Astley	Yes	1560	2333	49.5	0	0	0.0	Moderate	Moderate
Chapel Street	Barwell	Yes	2733	3650	33.5	0	0	0.0	Moderate	Moderate
Aston Lane	Sharnwood	No	1512	2758	82.4	0	0	20.1	Moderate	Minor
M69 (from J2 to J1)	M69 SB	No	31005	42774	38.0	2565	4349	69.6	Moderate	Negligible

Road	Location	Near to Sensitive Receptors	AADT Total Vehicles			AADT HGV's			Magnitude of Change Criteria	Significance of Traffic Effects
			2036 Without Development	2036 With Development	% Change	2036 Without Development	2036 With Development	% Change		
Aston Lane	East of Hinckley	No	1603	2820	75.9	55	63	15.4	Moderate	Negligible
B587 Melbourne Road	North of Ashby de la Zouch	No	8683	8872	2.2	183	310	69.4	Moderate	Negligible
B4114 Coventry Road	Between Sapcote and B581	No	13210	15451	17	650	1042	60.3	Moderate	Negligible
Westfield Road	Hinckley	Yes	2994	3457	15.5	81	83	2.9	Minor	Moderate
Forest Road	Huncote	Yes	3983	4703	18.1	72	73	2.0	Minor	Moderate
M69 (from J1 to J2)	M69 NB	No	28831	40518	40.5	2566	4097	59.7	Minor	Negligible
A5	South of M69 J1	No	20987	19581	-6.7	2396	3528	47.2	Minor	Negligible
A5	Between B4455 (Fosse Way) and Magna Park	No	17709	17825	0.7	2161	3389	56.8	Minor	Negligible
A5	Between Magna Park and A426	No	16290	15746	-3.3	1894	2830	49.5	Minor	Negligible
A5	Between A426 and junction with M6	No	17328	17747	2.4	2420	3353	38.5	Minor	Negligible
A5	West of M1 J18	No	13103	13182	0.6	1705	2557	49.9	Minor	Negligible
M69 (from M6 to M69 J1)	M69 NB	No	37256	40194	7.9	1545	2214	43.3	Minor	Negligible
M69 (from J1 to M6)	M69 SB	No	39161	42103	7.5	1859	2577	38.6	Minor	Negligible
A447 Ashby Road	North of junction with A47	No	14725	14980	1.7	876	1238	41.4	Minor	Negligible
Stapleton Lane	Barwell	No	5548	7340	32.3	63	63	0.6	Minor	Negligible

Road	Location	Near to Sensitive Receptors	AADT Total Vehicles			AADT HGV's			Magnitude of Change Criteria	Significance of Traffic Effects
			2036 Without Development	2036 With Development	% Change	2036 Without Development	2036 With Development	% Change		
A447 Hinckley Road	North of Barwell	No	13174	14717	11.7	867	1224	41.2	Minor	Negligible
A447 Hinckley Road	South of Ibstock	No	14866	15345	3.2	779	1087	39.5	Minor	Negligible
Atterton Lane	East of Atherstone	No	340	475	39.4	21	26	19.8	Minor	Negligible
A5	West of B4116 (Atherstone)	No	20088	19519	-2.8	1519	2133	40.4	Minor	Negligible
Stoke Road	North of MIRA	No	650	952	46.5	0	0	0.0	Minor	Negligible
B4116 Sheepy Road	South of Twycross	No	3914	4323	10.5	112	148	32.4	Minor	Negligible
Stoneygate Drive	Hinckley	No	6400	9078	41.8	4	2	-44.3	Minor	Negligible
Burton Lane	Burton Hastings	No	3271	4298	31.4	247	268	8.7	Minor	Negligible
A5	West of M69 J1	No	25387	25037	-1.4	2480	2896	16.8	Negligible	Negligible
A5	West of Longshoot	No	17621	17356	-1.5	3056	3902	27.7	Negligible	Negligible

8.217 A combination of magnitude of traffic flow change and the receptor sensitivity determines the overall significance of traffic effects as described in paragraph 8.52. The results are shown below in Figure 8.3.

Figure 8.2: Defining the Area of Influence; Level of Change

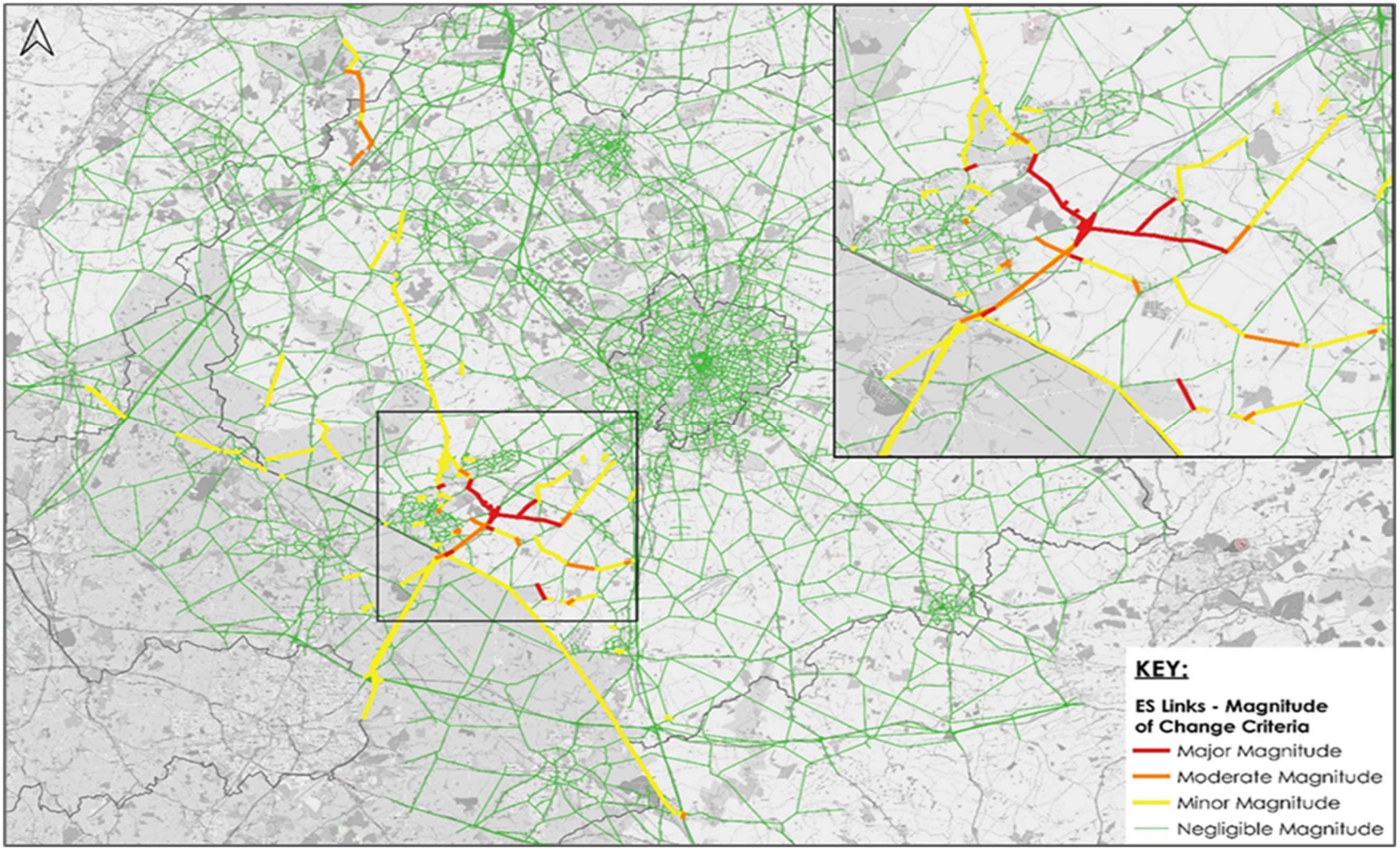
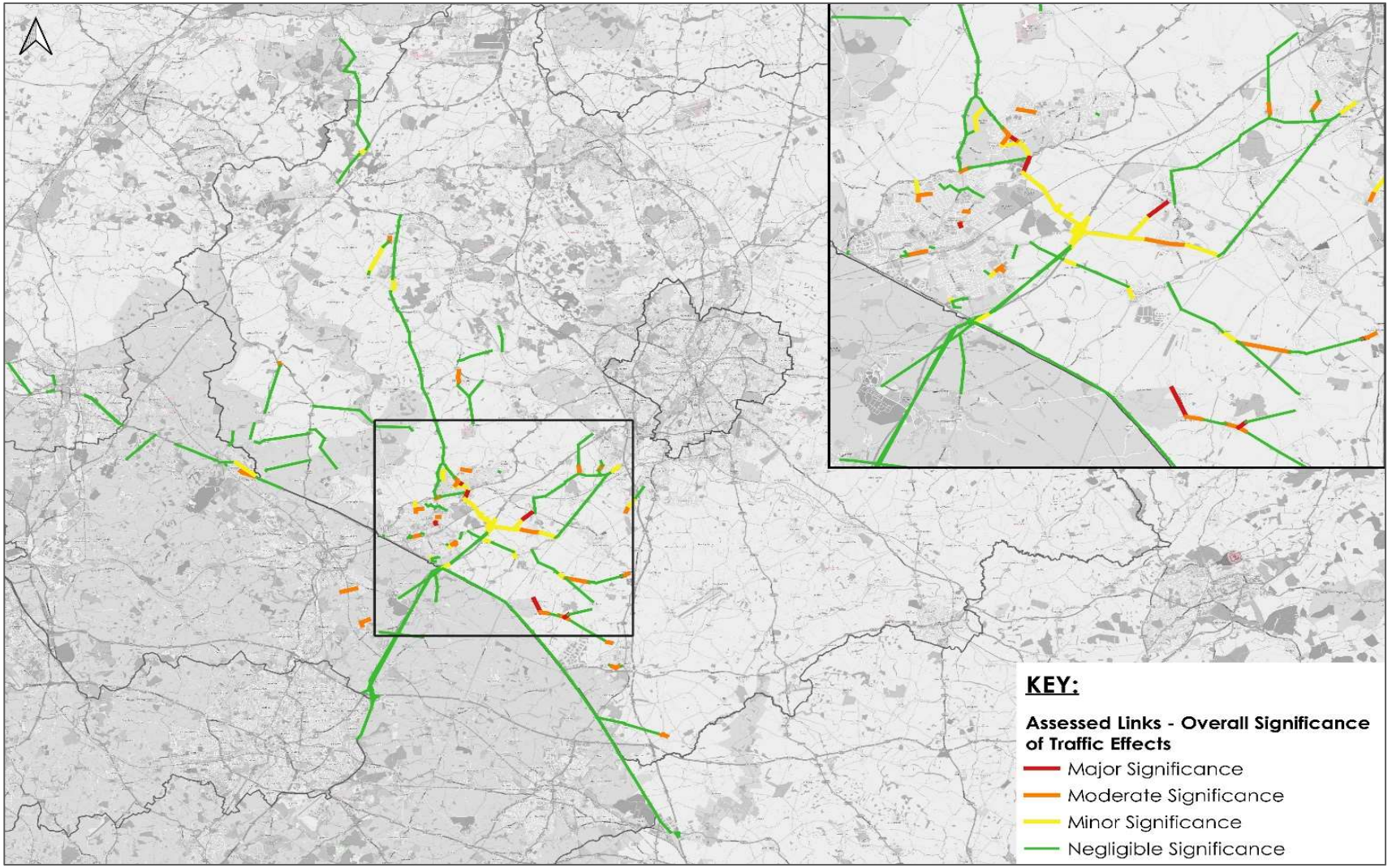


Figure 8.1: Significance of traffic effects



Severance

8.218 The predicted total change in traffic has been listed in Table 8.5. With respect to links with major or moderate levels of significance once sensitivity and magnitude is mapped, severance applies to four key links:

- B4668 Leicester Road- A47 Link Road- Major significance. New access junction onto Leicester Road will result in some of the Proposed Development traffic and reassigned local traffic to use the B4668 to access the A47 resulting in a rise in HGV numbers.
- Main Road Claybrooke Magna- Major significance. A low baseline traffic flow is affected by a large percentage uplift in light traffic through the day close to a school. This is attributable to rerouting of existing traffic. However, absolute numbers remain small across 24 hours.
- A47 East of Junction with A447- Moderate significance. Percentage increase in HGVs rather than overall traffic, sensitivity is moderate.
- B4669 between J2 M69 and Stanton Lane- Moderate significance. Percentage increase in traffic is major, but sensitivity is low due to being close to the SRN junction and having no frontages.

Driver delay

8.219 Driver delay is based on levels of Volume over Capacity (VoC) produced by the PRTM and application of professional judgement. The following junctions have been identified as having VoC above 85% with a 5% change because of the Proposed Developments traffic impacts.

8.220 Forty junctions have been reviewed in detail and based on the outputs from the PRTM model and observed flows.

8.221 A review of the VoC and the flow changes at the long list of junctions enabled a more focused application of standalone junction modelling to test the functionality during the network peak hours in the worst case. Junctions within the Study Area that will exceed their theoretical capacity at 2036 WD are:

- Ashby Rd / A47
- Hinckley Rd / New Rd / B581
- New Rd / Long St / Broughton Rd
- B4669 /Stanton Lane
- A5 / A426 /Gibbet Lane
- A5 / A4303 /B4027 / Coal Pit lane

- Coventry Road/Croft Road

8.222 Further detailed micro-simulation modelling is being carried out at the SRN interfaces which experience the largest flow change as a result of the Proposed Development;

- M69 Junction 2
- M69 Junction 1

8.223 Further micro-simulation modelling maybe required following the outcomes of the new model run on the Warwickshire and SRN area that sits outside the core model network is being carried out on additional SRN interfaces which have limited flow change as a result of the Proposed Development at the request of NH. This will be reported on in the final ES.

Fear and Intimidation

8.224 Fear and intimidation has been assessed using the outputs from Table 8.5. The results indicate similar impacts at the four links listed in paragraph 8.209

- B4668 Leicester Road- A47 Link Road- Major significance, New junction onto Leicester Road will filter some of the Proposed Development traffic to the A47 resulting in a rise in HGV numbers.
- Main Road Claybrooke Magna- Major significance- A low baseline traffic flow is affected by a large percentage uplift in light traffic through the day close to a school. However, absolute numbers remain small across 24 hours (762 vehicles).
- A47 East of Junction with A447- Moderate significance. Percentage increase in HGVs rather than overall traffic, sensitivity is moderate.
- B4669 between Junction 2 M69 and Stanton Lane- Moderate significance. Percentage increase in traffic is major, but sensitivity is low due to being close to the SRN junction and having no frontages.

Pedestrian/cycle amenity

8.225 Pedestrian and cycling amenity has been reviewed for routes, filtered and displayed in Table 8.5. Of these, the following routes have moderate or major impact significance:

- B4668 Leicester Road- A47 Link Road- Major significance. New junction onto Leicester Road will filter some of the Proposed Development traffic to the A47 resulting in a rise in HGV numbers.
- B4669 Leicester Road Sapcote- Moderate significance, uplift in AADT of general traffic, sensitivity minor.
- Main Road Claybrooke Magna- Moderate significance. A low baseline traffic flow is affected by an large percentage uplift in light traffic

- B4669 between J2 M69 and Stanton Lane- Moderate significance. Percentage increase in traffic is major, but sensitivity is low due to being close to the SRN junction and having no frontages.

- Stanton Lane/Hinckley Road Stoney Stanton- Moderate significance, AADT increase for general traffic,

- B4669 Leicester Road East of Sapcote- Moderate significance.

Accidents and safety

8.226 The IEMA guidelines state that an assessment of road safety on the highway network should be undertaken based on recent accident records. Personal Injury Accident (PIA) records have been obtained from the DfT's road safety data for the latest available five year period. Typical annual average accident rates along links are calculated in accordance with guidance provided by the DfT, making use of its COBALT software to carry out accident calculations.

8.227 At the time of writing this PEIR, Road safety statistics have been reviewed for the surrounding highway networks. A detailed COBALT review is currently a work in progress due to a recent change to the DfT software package and updating of the strategic modelling data. Initial results suggest impacts of increased traffic flow change happen on routes where accidents are comparatively low. The exception to this is Junction 21 of the M1. Villages east of the M69 motorway and routes west around the A47 do not appear to have particularly high concentrations of collisions.

8.228 For the purpose of determining the magnitude of change (relating to accidents and safety) the same levels of significance as set out in

8.229 Table 8.4 will be applied to the changes in predicted accidents.

8.230 The sensitivity of accidents and safety along each link will be based on the actual average annual accident rate in comparison to the typical average annual accident rate. Where the actual rate are lower than the typical, sensitivity will be classed as low. Where the rates are approximately equal, sensitivity would be classed as medium and where the actual rate is higher than the typical sensitivity would be classed as high.

8.231 Road Safety is also being reviewed as part of the TA and associated Technical Note which will be completed following the latest model run to inform the distribution and routing of existing and proposed traffic in the future operating and construction years.

8.232 Road Safety Audits will be undertaken at each stage of the works development process with Stage 1 Road Safety Audits being undertaken on the mitigation schemes for the final submission.

8.233 Removing HGV's from the national networks reduces the occurrence of collisions on the network by reducing distances travelled. This is due to the net HGV mileage saved by using rail infrastructure for the primary movement of freight from the ports.

Railway capacity

8.234 Network Rail has confirmed that the addition of new train movements for the Proposed Development will be required to fit around the existing services within the working timetable. Network Rail has both contractual and regulatory obligations to existing users of the network in terms of the timing of their trains in the working timetable.

8.235 These additional train movements are neither guaranteed nor reserved for the Proposed Development, but merely demonstrates the availability for trains in the working timetable on this route on the rail network. Which services will run, and their timings will all depend on applications by individual Freight Operating Companies as needed once the terminal is operational. It should be noted that this position is consistent with Network Rail and the wider rail industry's established approach to the identification of potential paths at this point in the development cycle.

Level crossings

8.236 Table 8.6 below indicates works to level crossings and associated access and limitations. Where crossings are maintained, they are either enhanced (footbridge) or diverted to improve safety for all users.

Table 8.6 Level crossing modifications proposed in connection with the HNRFI development

Level crossing	Works proposed	Access and limitations proposed in the draft DCO
Thorney Fields Farm No 2: Grid Ref: SP480959 Footpath No. U17/1, 1 km NW of Sapcote	Public right of way diversion with pedestrian traffic rerouted to an existing bridge over the railway south of Thorney Fields Farm.	No change
Elmesthorpe: Grid Ref: SP471958 Elmesthorpe: Footpath No. T89/1between Bostock Close and the B581 Station Road, opposite the Wentworth Arms public house	Miniature Stop Lights (MSL) for pedestrians [subject to NR confirmation] Public right of way diversion with pedestrian traffic rerouted to an existing bridge over the railway at Station Road	No change
Earl Shilton: Grid Ref: SP460954	Permanent closure. The footpath to the east of this level crossing is proposed to be stopped	Permanent closure

Level crossing	Works proposed	Access and limitations proposed in the draft DCO
Earl Shilton: Footpath No: U50/3 connecting Elmesthorpe to the north with Burbage Common Road	up, meaning that the level crossing would have no future purpose.	
Barwell: Grid Ref: SP457952 Barwell: Footpath No. V23/1, Connecting the Elmesthorpe-Burbage Common Bridleway (U52/9) with Burbage Common Road to the east of the railway.	Permanent closure. The footpath to the east of this level crossing is proposed to be stopped up, meaning that the level crossing would have no future purpose.	Permanent closure
The Outwoods: Grid Ref: SP442941 Footpath no. U8/1, connecting Burbage and the Hinckley Academy and John Cleveland Sixth Form Centre in Hinckley.	Replacement of the level crossing with a pedestrian footbridge, with associated public rights of way diversions.	No change

Beneficial Effects

8.237 It should be noted that the Proposed Development including access infrastructure will also result in reduction of traffic on a number of links. Links benefiting from lower traffic flows are summarised below in Table 8.6 and illustrated in Figure 8.4. It should be noted that the major positive effects shown within Figure 8.4 are on short stretches on minor residential road. They are based on large percentage changes on low background figures. For example, a reduction of 2 cars on a street with 10 movements would register as a 20% reduction. Therefore, they are not included Table 8.7.

Table 8.67: Positive highway impact

Road	Location	Near to Sensitive Receptors	AADT Total Vehicles			AADT HGV's			Magnitude of Positive Change Criteria
			2036 Without Development	2036 With Development	% Change	2036 Without Development	2036 With Development	% Change	
Grace Road	Sapcote	No	5264	3589	-31.8	108	66	-38.7	Minor Positive
B581 Station Road	West of Stoney Stanton	No	13089	9735	-25.6	385	206	-46.6	Minor Positive

Road	Location	Near to Sensitive Receptors	AADT Total Vehicles			AADT HGV's			Magnitude of Positive Change Criteria
			2036 Without Development	2036 With Development	% Change	2036 Without Development	2036 With Development	% Change	
B581 Broughton Road	East of Stoney Stanton	No	6015	4779	-20.5	254	150	-40.9	Minor Positive
B4114 Leicester Road	Sharnford	Yes	12914	9537	-26.2	815	791	-3.0	Minor Positive
B4114 Coventry Road	North of A5	No	5016	3284	-34.5	778	737	-5.3	Minor Positive
Cosby Road	Broughton Astley	Yes	4016	2888	-28.1	52	50	-4.3	Minor Positive
Arbor Road	Croft	Yes	1736	1355	-21.9	0	0	0.0	Minor Positive
B590 Leicester Road	Hinckley	Yes	5202	3641	-30	3	3	12.9	Minor Positive
B581 Station Road	Elmesthorpe	No	13089	9735	-25.6	385	206	-46.6	Minor Positive
B4669 Sapcote Road	Hinckley - East of B578	No	16316	14518	-11	267	267	0.1	Negligible
A47 Dodwells Road	Hinckley - North of A5	No	15292	13033	-14.8	1186	1325	11.7	Negligible

Figure 8.2: Traffic reduction

A5 Watling Street Railway Bridge

8.238 It is worth noting that if the A5 is closed and traffic rerouted due to a bridge strike as part of NH' diversion strategy. The inclusion of the south facing slip roads at M69 J2 and the A47 Link Road will help provide another suitable alternative route to remove traffic from other local routes.

Commentary on traffic flow and capacity impact

8.239 Link analysis using the IEMA thresholds indicates circa forty links affected during the operational phase of the Proposed Development. Of these the majority are within 2km of the HNRFI Site, with other outliers as a result in change in percentage flow above the baseline. Most of the links fall within the negligible to minor magnitude category being either below 30% or between 30% and 60% change when compared with the baseline position for non-sensitive sites or below 10% or between 10 and 30% for those sites close to sensitive receptors.

8.240 Moderate or Major impact orders of magnitude for the 'with Proposed Development' scenario are predominately on roads located in the Eastern Village areas such as Sapcote, Stoney Stanton or adjacent to the HNRFI Site, such as the B4669 and B4668. These roads are listed below and the impacts correspond closely with the junction capacity constraints and identified through the SATURN filtering process.

- B4668 Leicester Road
- A47 (At its junction with B4668)
- B4669 East of M69 J2
- Stanton Lane/Hinckley Road- Stoney Stanton
- B4669 Leicester Road
- Hinckley Road-Stoney Stanton.

PROPOSED MITIGATION

Construction

Construction Traffic Management Plan (CTMP)

8.241 It is proposed that a Construction Traffic Management Plan (CTMP) will be implemented by the contractor to address the potential adverse effects of the construction on the local surrounding highway network in advance of construction. The CTMP will be developed further once modelling based on the construction phasing has been completed.

8.242 During the construction of the access infrastructure- the south facing slips and the A47

Link Road- there will be short term temporary impacts associated with construction traffic on roads routing from the south of the site. These have been reviewed at a high level based on initial phasing estimates and distribution from potential contractors. Rule 1 thresholds for HGVs are generally below 30% for most routes, with absolute numbers well below 100 daily two way HGV trips.

8.243 There will be some routes closer to the site on the B4669 and on routes through Hinckley which will experience percentage impacts above the 30% threshold. However, there will be no likely significant effects on traffic and transport due to their temporary short-term nature. These will be managed as far as possible through the CTMP.

8.244 The CTMP will encompass all the necessary measures required to ensure that works potentially affecting the highway are adequately addressed. It will provide a framework to help ensure that all necessary mitigation and remedial measures are in place to deal with these during the construction. In addition to the adoption of standard best practice approaches, several specific mitigation measures will be included in the CTMP for example:

- Highways to be kept clear of mud and debris.
- A construction phase delivery strategy to control the timing and routing of delivery vehicles.
- Group transport to the HNRFI Site for construction workers to reduce the number of private car trips.

Operation

8.245 The determination of the significance of the effects is a judgement as to whether the magnitude and duration of impacts, when combined with the characteristics of the road network and the sensitivity of receptors, would have a regional or district scale effect or are important at the local scale but cumulatively lead to an overall increase in the effects of traffic.

8.246 If this is the case, then the effects are significant according to the EIA Regulations. If the effect is likely to be beneath levels of perception, it is insignificant, as set out by the EIA Regulations. Where the effect on a road link has been identified to be significant, mitigation has been proposed to reduce the effect to a not significant level.

8.247 A comprehensive package of on and off-site transport improvements are proposed as part of the Proposed Development. Besides local improvements for walking, cycling and public transport, there will be some improvements which will benefit general traffic. These are outlined in the following paragraphs.

Walking/cycling/Horse riders

8.248 New and improved walking and cycling routes proposed both on and off the HNRFI Site - a summary is provided below:

- Shared pedestrian and cycleway on the new A47 Link Road through the HNRFI Site.
- Enhancements to B4669 East of the M69 motorway to Sapcote.

8.249 As set out in the Public Rights of Way Appraisal and Strategy (Appendix 11.2) the following improvements are provided.

8.250 The PRoW assessment has identified that the majority of footpaths within the site are only lightly used and there is considered to be significant capacity to support new users on the existing network. Whilst some re-routing will be required as part of the development, access to the existing network would be enhanced through the creation of new linkages, improved marking of routes, removal of obstructions, appropriate vegetation management and the removal of gates/stiles as part of an overall enhancement programme.

8.251 Shared paths will be provided adjacent to all roads through the site, allowing continued pedestrian access north, east, south and west through the site, whilst new bridleway provision will also provide access for walkers.

8.252 Two footpath routes - (Footpaths V23/1 and U50/3) cross the Hinckley to Leicester railway line via unprotected crossings. These are footpath, bridleway and user worked crossings where the onus is on the crossing user to check for an approaching train before they cross the railway. It is proposed to close these two crossings and instead provide a link southward from Footpath U50/4 along the northern edge of the railway, passing Footpath V23/1 and linking with Bridleway U52/9 and Footpath U52/8 which provide a safer route via a new bridge over the railway.

8.253 There are opportunities to improve cycle provision on-site via alternative, traffic-free or improved routes. These include a cycle path adjacent to all traffic routes within the site, thereby providing a north-east to west and south connectivity and a valuable link between Burbage Common, Hinckley and Burbage to Elmesthorpe

8.254 Provision for Horse riders - Whilst part of Burbage Common Road will be stopped up through the HNFRI Site, the proposals represent an opportunity to create a traffic free, dedicated bridleway route around the perimeter of the HNRFI Site. Diversions are proposed at existing level crossings identified Table 8.6 that allow safe crossing on the new rail bridge.

8.255 The new route starts at the northern end of the site, travelling east, then south down the eastern edge of the site through a wide landscaped corridor, linking up with Bridleway V29 that provides an onward connection to the east. The new route then continues south along the eastern edge towards the M69 Junction, turning west and crossing the road via a suitable crossing. The route then meanders around the edge of the Ancient Woodland of Freeholt Wood through an attractive, naturalistic corridor separated from the commercial development to the north before heading west through a wide-open landscaped area designed to complement the Burbage Common and Woods Country Park. The new route then exits the site connecting with Bridleway U51 and the Leicestershire Round promoted route, both of which pass through the Country Park. See EDP Figure

11.14 for plan of the PRoW Strategy.

Public transport

8.256 The nearest bus stops to the HNRFI Site are located approximately 200m west of the M69 Junction 2. These stops are served by the X6 bus, operated by Arriva Midlands.

8.257 The X6 runs between Coventry and Leicester, operating a two hourly service between 07.25 and 19.10. Travel time to Coventry is approximately 45 minutes, with Leicester approximately 40 minutes away.

8.258 Current proposals for HNRFI are to improve bus accessibility to the HNRFI Site from both Leicester and Coventry by enhancing the X6 services. This is with the aim to provide a more regular (hourly) service which coincides with major shift changes on site (6am/2pm/10pm). The coverage of Coventry and Leicester will help improve accessibility from those areas where employees are most likely to be drawn. This will be subject to agreement with the operators and TSH.

8.259 Local services are also available from Hinckley and through to Nuneaton. These include higher frequency services 158 and 48 which pass close to the site from the A47. Diversion is unlikely into the HNRFI site for these routes, due to an established timetable and customer base. However, extension of the service by 1-2 hours either side of the day could help improve accessibility for shift workers. Again, this is subject to further discussion and agreement with operators and the applicant.

8.260 Hinckley has a railway station, served by Cross Country trains. This is situated on the Birmingham – Peterborough line. Services run between Hinckley and Birmingham / Leicester depending on direction of travel, with usually one train per hour in either direction. Options have been tabled with the Leicestershire Public Transport team and following discussions with Arriva, to consider demand responsive public transport (buses) to link with the arrival of trains at Hinckley. This is to be developed further though it is likely that this would be in the latter stages of development and more likely to serve staff working office hours at the Site.

8.261 Arriva Midlands are also testing on-demand bus services in the South Leicester area after successful implementation at Lubbesthorpe. These types of services are likely to form part of the HNFRI bus strategy as they are demand responsive and adaptable to the needs of potential employees that do not live on direct routes to the HNRFI Site. This could cover rural areas to the East. Arriva would consider fixed routes as demand rises with the increased employee numbers at the HNRFI Site.

Travel Plan and Smarter Travel Measures

8.262 A Draft Framework Site Wide Travel Plan- Appendix 8.2 is being developed alongside the TA and in accordance with the guidelines in the DfT documents – 'Good Practice Guidelines: Delivering Travel Plans through the Travel Plan Process'. The Travel Plan includes complementary measures to encourage walking, cycling, bus and car sharing as modes of transport. These are focused into key measures for consideration, a number of

which are included below:

- Cycle to Work Scheme: Investigate implementing a cycle to work scheme where employees will be able to enter into a salary sacrifice scheme for employees in order to purchase a bike at a discount.
- Personalised Travel Planning: All employers will offer personalised travel planning to all staff, to be undertaken by the associated travel plan coordinator.
- Car Sharing and Car Club Participation: The Travel Plan Co-ordinator will promote existing car sharing services such as www.shareacar.com. This type of site does not require members to necessarily have a car as some existing members will offer lifts in exchange for a contribution towards fuel costs.
- Car Parking Management System.
- Reducing the need to travel: Where possible technology will be used to enable staff to work from home with potential for telephone and video conferencing facilities to aid the reduction of travel to customers, suppliers and partners.
- Subsidised bus transport for employees: to encourage greater bus use.
- Monitoring of the Travel Plan against Travel Plan targets.

Highway improvements

8.263 Given the nature of the Proposed Development with a high proportion of HGVs carrying goods to/from the rail freight terminal, a number of highways improvements, management, monitoring and enforcement are proposed to keep HGVs away from local roads and on to the SRN to minimise the impact on local residents.

8.264 In addition to providing for access to and from the Proposed Development and distributing traffic onto the network appropriately, the proposed improvements will provide benefits for the town by facilitating the redistribution of existing traffic away from sensitive areas in Hinckley.

8.265 The following highway improvements have been proposed to mitigate the traffic impact of the Proposed Development, this includes the first two items as Access Infrastructure, but also serve to mitigate wider impacts around Hinckley and the Eastern Villages:

- M69 Junction 2 south-facing slip roads to allow all movements.
- New A47 Link road between B4668 Leicester Road, the HNRFI Site and the M69 Junction 2 with access for all general traffic.
- Junction capacity improvements, including enhanced pedestrian facilities as follows:

Table 8.8: Proposed off-site mitigation

No.	Location	Works proposed	Highway Authority
Blaby DC			
B1	Junction of B581 Station Road / New Road and Hinckley Road, Stoney Stanton	The existing mini-roundabout would be replaced by traffic lights with signalised crossings for pedestrians.	Leics CC
B2	Junction of B4669 Hinckley Road and Stanton Lane, west of Sapcote	Traffic lights would be introduced with a phase to allow pedestrians and cyclists to cross.	Leics CC
B3	Stanton Lane / Hinckley Road, south-west of Stoney Stanton	Reduction of the speed limit to 40mph from the national speed limit; traffic calming features and formalisation of on-carriageway parking	Leics CC
B4	B4669 Hinckley Road/ Leicester Road, Sapcote	Traffic calming features, creation of cycle infrastructure and wider footways, public realm and junction improvements and a bus stop relocation at junction of Church Street and B4669. A new pedestrian crossing is included.	Leics CC
B5	Junction of B4114 Coventry Road and B581 Broughton Road at Soar Mill, south-east of Stoney Stanton	New traffic lights are already scheduled to be introduced as part of the Broughton Astley S278 works (Planning Ref: 19/00856/OUT). The Applicant proposes to widen the carriageway on the northbound approach to the B4114 Coventry Road and on the B581 Broughton Road to provide additional capacity for left-turning traffic on both arms. The left turn on Broughton Road would be provided as a separately signalised phase to enable it to run at the same time as the right turn into Broughton Road from Coventry Road to improve the efficiency of the junction.	Leics CC
B6	Junction of B4114 Coventry Road and Croft Road, south-west of Narborough	Lane widening on junction approaches	Leics CC
Hinckley and Bosworth BC			

No.	Location	Works proposed	Highway Authority
HB1	Junction of A47 Normandy Way and A447 Ashby Road, Hinckley	It is proposed that the approach roads to this junction would all be widened to accommodate additional traffic. Indicative right turn and two lanes would be provided through the junction in a westbound direction. Formal signal-controlled pedestrian crossing points would be introduced.	Leics CC
HB2	Junction of A47 Normandy Way / Leicester Road, the B4668 Leicester Road and The Common, south-east of Barwell	Widening of the entry arm on the B4668 Leicester Road	Leics CC
HB3	Junction of B4668 and New A47 Link Road, north east of the site access (Access Infrastructure)	Provision of a three arm new roundabout access to the B4668 Leicester Road, including a segregated left turn lane southbound from the A47.	Leics CC
Harborough DC			
H1	Cross in Hand roundabout at the junction of the A5 Watling Street, A4303 Coventry Road, B4428 Lutterworth Road and Coal Pit Lane, west of Lutterworth	Increased roundabout radius and widened lane entries, with two lanes marked for longer distances for traffic approaching the junction on the A5 Watling Street southbound and on Coal Pit Lane.	National Highways

HNRFI HGV Route Management Strategy

8.266 An HNRFI HGV Route Management Plan & Strategy report (HNRFI-BWB-GEN-XX-RP-TR-0009) is being developed, with a first draft shared with the TWG for initial comment and is a working draft document at this stage but can be found in Appendix 8.1.12 of the PEIR documents:

- the proposed HGV Route Management Strategy identifies preferred and undesirable routes to and from HNRFI before and after the delivery of new highway infrastructure associated with the site;

- for any end occupiers who operate high sided vehicles a mechanism will be put in place for checking heights of vehicles leaving and travelling to the B8 units with route management to avoid low bridges in the area including the A5 Nutts Lane Railway Bridge.

- the proposed enforcement mechanisms and monitoring of the HGV Route Management which may include ANPR monitoring.

8.267 Current weight restrictions within the area have been reviewed in order to develop an appropriate HGV route strategy.**Error! Reference source not found.** Section X of the emerging Strategy indicates existing restrictions around the HNRFI site, on the whole these are advisory, though 7.5t weight limits are present at:

- Huncote Roads (to the north of Stoney Stanton);
- Local roads in Stoney Stanton;
- Local roads in Barwell and Earl Shilton including Leicester Road and Station Road.

Current Height Restrictions at two railway bridges in the local area that could affect the routing of any high sided vehicles are as follows:

- A5 Hinckley (Nutts Lane); and
- Rugby Road, Hinckley

8.268 Subsequently, "permitted routes" for HGVs associated with the proposed development are set out as follows:

- To / from "The North":

  M69 north (J2), M1 north (J21)

- To / from "The East":

  M69 south (J2), A5 east (M69 J1), A4303, M1 south (J20), A14 (M1 J19)

- To / from "The Southeast":

  M69 south (J2), A5 east (M69 J1), A4303, M1 south (J20)

- To / from "The South":

  M69 south (J2), A46 south, M40 south (J15)

- To / from "The Southwest":

  M69 south (J2), M6 north (J2), M42 south (J4), M5 south; or

  M69 south (J2), A46 south, M5 south (J9)

- To / from "The Northwest":

  M69 south (J2), M6 north (J2); or

M69 south (J2), A5 west (M69 J1), M6 Toll / M6 north.

A47 south, A5 west (alternative route)

8.269 Whilst encouraging HGV traffic to use the strategic roads which surround the site, HGV traffic will be discouraged from using local roads which route through sensitive settings such as local villages to route between the site and the key strategic roads. However, HGVs are permitted to use any classification of road for access and local deliveries even if there is a weight restriction in place (unless it is a structural weight limit). As a main through route, HGVs are directed to use the most appropriate route via motorways, dual carriageways and main roads.

8.270 In case of an incident on the Strategic Road Network, there will be a site access emergency plan in place which will include alternative routes to/from the Site.

8.271 An indicative signage strategy for HGVs travelling to the HNRFI site is currently being developed. This strategy will be implemented by providing the appropriate road signs on the public highways within a wider area to navigate drivers to the site via the identified key routes and is subject to Local Planning and Highway approval.

8.272 As outlined above, the site benefits from a direct access onto the Strategic Road Network via M69 Junction 2. Routes will be signed on M69, M6, A5, A47 and A4303.

8.273 The HGV Route Management Plan & Strategy will include measures for the B8 unit occupiers and the Terminal operator to consider and sets out their responsibilities as well as measures to monitor, report and enforce the Route Management Strategy Further enforcement considerations are in development, but could include ANPR monitoring on-site and extending to sensitive areas is the need arises. Mitigation is to be discussed and considered following consultation with further details set out in the HGV Management Strategy.

Hazardous loads

8.274 Any hazardous loads transported to / from the distribution centre would be assessed and managed in line with the relevant environmental permits (EPs). This is covered under separate legislation and the risks of Major Accidents and Disasters are appraised in Chapter 19 of this PEIR.

RESIDUAL ENVIRONMENTAL EFFECTS

Construction phase

8.275 Assessment of the construction phase will follow based on more detailed phasing information. However, construction is phased over the period to 2036. It is considered that the number of construction vehicles accessing the HNRFI Site, relative to the volume and character of vehicular traffic on the surrounding highway network and the route which those vehicles take (M69, A5, A47) will be minor. The height and shapes of the

plateaux have been determined having regard to a desire to achieve a 'cut-fill balance' across the HNRFI site, obviating the need to import or export spoil.

8.276 There will be some temporary impacts on local roads prior to the completion of the south facing slip roads at J2 of the M69. This is within the first phase of works but is estimated to last for approximately 52 weeks. The CTMP will help to provide a framework for routing and access to the site during this sensitive and early period of the project. As discussed in earlier sections construction traffic numbers will be in the region of 10-15% of the operational traffic numbers- these figures will be further developed for the ES.

Operational phase

8.277 In order to mitigate the traffic generated by the Proposed Development a comprehensive package of sustainable transport measures are to be provided as set out above in paragraph 8.166- 8.172. In line with the guidelines, the operational phase of HNRFI with these improvements in place is described below.

Severance

8.278 Potential severance effects on the local community is the perception that a community is severed when it becomes separated by a major traffic route. Severance is difficult to measure, and by its subjective nature, is likely to vary between different groups within a single community. In addition to the volume, composition and speed of traffic, severance is also likely to be influenced by the geometric characteristics of a road, the demand for movement across a road, and the variety of land uses and the extent of community located on either side of a road. All these factors are considered when determining the likely severance effect.

8.279 In general terms, according to the IEMA guidelines, up to a 30% change in traffic flow is likely to produce a 'slight', up to a 60% change in traffic flow is likely to produce a 'moderate' and up to a 90% change in traffic flow is likely to produce a 'substantial' change in severance. These have been identified in Table 8.5.

8.280 HNRFI, with the proposed mitigation improvements in place is considered to have an overall direct impact of long-term minor adverse significance. This is because traffic from the HNRFI Site be distributed along major roads which already accommodate heavy traffic, such as the M69 motorway, and therefore any severance issues will already exist. Enhancements to pedestrian facilities and upgraded links to existing and proposed non-motorised routes will improve connectivity around the HNRFI Site- notably around Sapcote and Stoney Stanton.

8.281 Burbage Common Road is to be stopped up through the Site though access will be retained to local facilities. The realignment of the PRoW around the site will be less direct but will not prevent access to non-motorised users. The impact will be of long term minor adverse significance.

Driver delay

8.282 Delay to drivers generally occurs at junctions where vehicle manoeuvres are undertaken and which result in vehicles having to give-way. Driver delay could also occur on narrow rural roads if flows are increased (particularly those where it is difficult for vehicles to pass). Several roads and junctions surrounding the HNRFI Site could be affected by changes in vehicle demand resulting from the Proposed Development. As such traffic modelling has been undertaken as part of the TA to understand the impact on delay, queuing and capacity at key junctions and links on the surrounding highway network.

8.283 The modelling forecasts an increase in traffic on SRN. To mitigate this, highway improvements are proposed to ensure that no junctions will be operating over their theoretical capacity because of traffic associated with the Proposed Development. Furthermore, highway improvements such as the south-facing slip roads at the M69 Junction 2 and a new distributor road between connecting the B4668 to the M69 motorway will provide network wide benefits. It is therefore concluded that the Proposed Development is considered to have a direct impact of long-term minor adverse significance on driver delay.

Pedestrian delay

8.284 The delay incurred by pedestrians is generally a direct consequence of their ability to cross roads. Thus, the provision of crossing facilities, the geometric characteristics of the road, and the traffic volume, composition and speed are all factors that can affect pedestrian delay. These factors have been considered when assessing this effect. It should be noted that the IEA guidelines advise that in assessing levels of, and changes in, pedestrian delay, assessors do not attempt to use quantitative thresholds. This is due to the range of local factors and conditions which can influence pedestrian delay. Instead, the Guidelines recommend the use of professional judgement to determine whether pedestrian delay is a significant effect. Pedestrian delay has been considered in the context of the change in travel demand generated by the Proposed Development, the existing pedestrian facilities on the network and any potential increase in traffic flows.

8.285 Studies, quoted within the IEMA guidance (HFA et al, Assessment Methodology Report, The West London Assessment Studies, 1990) have shown that pedestrian delay is considered perceptible / significant if it exceeds 10 seconds for a link with no crossing facilities. These studies identify that a 10 second pedestrian delay broadly equates to a two-way link flow of 1,400 vehicles per hour.

8.286 The forecast increased traffic on the road network without mitigation would likely increase pedestrian delay at some locations, although this is offset by the proposed improved opportunities to cross the major roads around the HNRFI Site as part of the cycling and walking measures. It is therefore concluded that the Proposed Development is considered to have a direct impact of long term minor adverse significance on pedestrian delay.

Non-motorised users' amenity

8.287 The term pedestrian amenity is broadly defined as the relative pleasantness of a journey. It is considered to be affected by traffic flow, speed and composition, as well as footway width, lighting and quality and the separation/protection from traffic. It encompasses the overall relationship between pedestrians and traffic, including fear and intimidation which is the most emotive and difficult effect to quantify and assess. The IEA guidance references the DfT Manual of Environmental Appraisal (1983) which suggests that a tentative threshold for judging the significance of changes in pedestrian amenity would be where the traffic flow (or its HGV component) is halved or doubled. In addition to the pedestrian amenity, a consideration of non-motorised users, including cyclists and equestrian users has been included based on a similar methodology.

8.288 With the pedestrian and cycling facilities proposed as part of the Proposed Development, it is concluded that HNRFI is considered to have a direct impact of long term negligible to minor adverse significance on non-motorised users' amenity.

Fear and intimidation

8.289 Potential effects on pedestrians associated with fear and intimidation are caused by an increase in volume of traffic and its HGV composition, and the lack of protection caused by factors such as narrow footway widths. There are no commonly agreed thresholds for estimating levels of danger or fear and intimidation, however the IEMA guidelines suggest the adoption of values from Pedestrian Delay, Annoyance and Risk - Imperial College, Crompton (1981) when considering any effect on pedestrian fear and intimidation.

8.290 Given the location at the edge of town and with the package of pedestrian cycling and equestrian mitigation measures HNRFI is considered to have a direct impact of long term negligible to minor adverse significance on fear and intimidation issues.

Accidents and safety

8.291 The potential effects on road safety of links within the Study Area have not been considered in detail at this stage due to the Baseline traffic data not being available from the next model run of the PRTM. A full review will be included in the Final ES which will include Baseline Annual Average Collision Rates, alongside the typical rates with the Proposed Development and the Impact.

8.292 Consideration will also be given to the local circumstances close to the HNRFI Site, including Sapcote and Stoney Stanton. In particular traffic speed, flow and composition, as well as vehicle conflict, pedestrian activity and the potential increases in accidents which could result from the Proposed Development.

CUMULATIVE AND IN-COMBINATION EFFECTS

8.293 The majority of noteworthy, committed developments within the area have been

captured within the PRTM under the current local plan period further, Chapter 20 provides detailed review of the cumulative impacts, and therefore explicitly considered within the assessment scenarios. This includes allocated sites which will be built out during the plan period and associated changes to highway and transport infrastructure. The planning assumptions have been reviewed by the individual authorities party to the TWG.

8.294 The cumulative effects are therefore considered within the standard assessment scenarios and are not identified separately.

CLIMATE CHANGE

8.295 Climate change is the change in the general weather conditions prevailing over a long period of time, caused by the emissions of greenhouse gases. The impacts of the Proposed Development on climate change can therefore be considered in terms of the volume of greenhouse gas emitted by the Proposed Development. In transportation terms, greenhouse gases are emitted by combustion engine vehicle trips.

8.296 HNRFI will provide a major shift from road transport to rail. Specialist inputs from Baker Rose Ltd has reviewed the HGV mileage saved per annum; This is included in Table 7.7 This review has included all potential routes to ports predicted to supply the HNRFI Site. General HGV movements based on existing rail freight efficiencies, including Twenty Foot Equivalent Units (TEU) per train, loading efficiencies and distances to and from ports/destinations.

8.297 The following figures indicate road mileage saved and demonstrate substantial savings of greenhouse gas emissions, which would only be further improved as cleaner freight train technologies develop.

Table 7.7: Total HGV mileage saved per annum (million miles)

Occupiers	25.5
Offsite	57.5
Total	83

SUMMARY AND CONCLUSIONS

8.298 The Transport and Traffic effects of the HNRFI project have been reviewed in accordance with the IEMA recommended thresholds for assessment.

8.299 A Transport Working Group (TWG) has been established with the principal local highway authorities with an interest in the project's area of influence. This includes NH as custodians of the strategic road network (SRN). The TWG purpose is to review, advise and agree on modelling appraisal, transport strategy and to agree an acceptable approach to

understanding the impacts of the HNRFI scheme on the local and strategic transport networks.

8.300 Revised runs of the Leicestershire Pan Regional Transport Model (PRTM) have taken place at the request of the TWG. This was to make use of the latest update to the model (2.2), which contained a greater level of refinement above previous versions. These amendments include specific trip rates for strategic sites and adjustments to the planning data inputs (cumulative impact) and trajectories for both development and infrastructure in the Area of Influence. This approach also enabled the TWG to agree the scope and scenarios of the modelling ahead of its production.

8.301 Scenarios tested with the PRTM 2.2 model reviewed the access infrastructure both with and without the HNRFI Site. This was to understand the influence of background traffic redistribution because of new roads creating more convenient links to established areas. It is evident from the outputs, that the redistribution of background traffic contributes more to the overall effects of the Proposed Development than the generation of vehicles from the HNRFI Site itself. The effects of the Proposed Development and the access infrastructure together has been assessed within this document.

Development impact

8.302 Data outputs from the PRTM 2.2 model have been used to establish 24-hour Annual Average Daily Traffic flows (AADT) and the respective flow changes in traffic per link. This data has then been used to understand the change in flow above the future baseline in percentage terms. The recommended thresholds for EA established by IEMA for transport impacts were then applied across the Study Area. Sensitive receptors were plotted using GIS mapping systems and magnitude thresholds adjusted accordingly.

8.303 The resulting analysis produced a list of links for which the magnitude of change in traffic required further review to test significance of effect. The majority of the forty links identified were deemed to fall within minor or negligible thresholds as the uplift in either general vehicles or HGVs was below 60% (non-sensitive) or between 10% and 30% for sensitive areas.

8.304 Those links experiencing moderate or major change because of the Proposed Development traffic were identified to be predominantly closer to the HNRFI Site and away from the SRN. These areas are subject to mitigation proposals to improve junction capacity or enhance footways and cycleways.

8.305 The construction of the Proposed Development is programmed across a finite period of time, and it is therefore considered that there will be minimal residual traffic impact on the highway network following completion of the construction phase. This will be subject to further testing ahead of the final ES.

8.306 A summary of the effects on highway specific conditions; namely severance, driver stress and delay, pedestrian and cyclist amenity, fear and intimidation and safety has been included within the report. All the conditions are a function of the two rule criteria relating to traffic and HGV percentage changes. However, greater granularity in the review of the

conditions is to be provided for the final ES.

Mitigation

8.307 Once HNRFI is fully operational a significant number of on and off-site mitigation measures will have been installed to encourage sustainable transport modes and reduce the number of single occupant car journeys. This includes new and enhanced bus provision, improved pedestrian crossing facilities, new cycle lanes and footways to access the Site.

Residual impact

8.308 It is considered that the Proposed Development coupled with these proposals listed above will have a direct impact of long term negligible to minor adverse significance upon severance, driver delay, pedestrian delay, non-motorised users' amenity, fear and intimidation and accidents and safety.

8.309 A Draft Interim TA and Travel Plan accompanies this PEIR Chapter. This will be updated and refined for the final ES submission.

8.310 Work is ongoing on the assessment of traffic impacts which will inform the final TA and Transport ES Chapter. This includes updates to the items listed below following a further update to the strategic modelling. The main tasks are listed below:

- A new run of the PRTM following amendments to the core model.
- VISSIM microsimulation models for future scenarios at M69 Junctions 1 and 2.
- Revisit and update detailed junction modelling (Junctions 9 and Linsig) for off-site junctions.
- Preliminary design for off-site junction amendments.
- Finalising pedestrian and cycle upgrade designs and traffic management proposals.
- Modelling principles around the interface with Warwickshire's highway network.
- Agreements around Sustainable Transport Strategy and Travel Plan with TWG.
- Finalising HGV Routing Strategy with TWG.
- Agreements on infrastructure design.

Tritax Symmetry (Hinckley) Limited

HINCKLEY NATIONAL RAIL FREIGHT INTERCHANGE

Preliminary Environmental Information Report

Chapter 9: Air quality

January 2022

This document forms a part of a Preliminary Environmental Information Report (PEIR) for the Hinckley National Rail Freight Interchange project.

A PEIR presents environmental information to assist consultees to form an informed view of the likely significant environmental effects of a proposed development and provide feedback.

This PEIR has been prepared by the project promoter, Tritax Symmetry (Hinckley) Limited. The Proposed Development is described in Chapter 3 of the PEIR and is the subject of a public consultation running from 12 January to 9 March 2022.

Details of how to respond to the public consultation are provided at the end of Chapter 1 of the PEIR and on the project website:

http://www.hinckleynrfi.co.uk/

This feedback will be taken into account by Tritax Symmetry (Hinckley) Limited in the preparation of its application for a Development Consent Order for the project.

Chapter Nine ◆ Air Quality

INTRODUCTION

9.1. This Chapter summarises the assessment work undertaken on the Hinckley National Rail Freight Interchange (HNRFI) scheme with regards to air quality.

9.2. This Chapter describes the methods used to assess the impacts, the baseline conditions currently existing at the Order Limits and study areas identified and the potential direct and indirect impacts of the Proposed Development. Where applicable, it also identifies mitigation measures required to prevent, reduce to offset these impacts and describes the remaining (residual) impacts with such mitigation measures in place.

9.3. This Chapter was completed by members of the BWB Air Quality Team who were responsible for undertaking the studies and assessments reported, contributing to the information described and for compiling this Chapter and the corresponding appendices. The assessment team are members of the Institute of Air Quality Management (IAQM) and Institution of Environmental Sciences (IES).

9.4. This report is necessarily technical in nature, so to assist the reader, a glossary of air quality terminology can be found in Appendix 9.1.

9.5. This Chapter is accompanied by the following appendices:

- Appendix 9.1: Air Quality Glossary of Terms.
- Appendix 9.2: Air Quality National Legislation and Planning Policy.
- Appendix 9.3: Air Quality Construction Phase Dust Assessment.
- Appendix 9.4: Air Quality Road Traffic Emissions Assessment - Existing Human Receptor Locations.
- Appendix 9.5: Air Quality Road Traffic Emissions Assessment - Ecological Transect Locations.
- Appendix 9.6: Wind Rose Utilised in the Air Quality Assessment.
- Appendix 9.7: DEFRA Background Map Concentrations used in the Air Quality Assessment.
- Appendix 9.8: Verification of the Air Quality Model.
- Appendix 9.9: Local Authority Air Quality Monitoring within the Study Area.
- Appendix 9.10: Air Quality Operational Phase Road Traffic Emissions Assessment Full

Results.

- Appendix 9.11: Air Quality Operational Phase Road Traffic Emissions Assessment- DMRB Magnitude.

  Appendix 9.12: Air Quality Operational Phase Road Traffic Emissions Assessment of Ecological Receptors- Full Results.

METHODOLOGY AND DATA SOURCES

The 2020 Scoping Opinion

9.6. An EIA Scoping Report was submitted to the Planning Inspectorate (PINS) in November 2020 which provided an outline approach for the identification and assessment of likely significant effects for air quality.

9.7. In December 2020 PINS, on behalf of the Secretary of State (SoS) and key stakeholders, returned their Scoping Opinion to the Applicant and comments related to air quality are provided in Table 9.1 and Table 9.2.

Table 9.1: Planning Inspectorate's comments from EIA Scoping Opinion in relation to air quality (December 2020)

Secretary of State	Scoping Opinion Response	Response to Comments
Detailed (quantitative assessment of operational energy plant emissions)	The report states that energy production from plant(s) are likely to be installed to the warehousing element of the Proposed Development. A detailed assessment of emissions from this infrastructure is proposed to be scoped out, as the Proposed Development would not be sufficiently progressed to allow for a quantitative assessment of operational emissions. The Scoping Report provides no explanation of the potential nature of the energy facility (fuel types, potential capacity). Given the lack of information the Inspectorate is unable to scope this matter out.	Information regarding the potential nature of the energy facility is provided within the Assessment Methodology section of this Chapter. A detailed assessment of the energy facility emissions was not undertaken as part of the PEIR as detailed information was not available at the time of assessment. Air dispersion modelling of emissions from the energy facility is proposed as part of the ES

Secretary of State	Scoping Opinion Response	Response to Comments
Receptors	The Scoping Report describes potentially sensitive receptors including Air Quality Management Areas (AQMAs). The ES should include the figures to indicate the location of these receptors.	Noted. Human receptor locations (road traffic emissions assessment) are shown on Figures 9.3-9.8 and detailed within Appendix 9.4.
Study Area	The Scoping Report suggests that the study area will be established based on the Affected Road Network. The ES should also justify the extent of consideration of the affected areas of the rail network in the geographic scope of the assessment.	The rail network geographic scope was established in accordance with relevant guidance and details are provided within the Assessment Methodology section of this Chapter.
Sensitive Receptors	The Scoping Report identifies locations where members of the public would spend extended periods of time and experience longer periods of exposure. Burbage Woods and Burbage Common are missing from this list but are identified as popular leisure destinations by Stoney Stanton Parish Council.	Receptor locations, including Burbage Woods and Common, were considered within the assessment for the construction and operational phases. Existing receptor locations are considered within the operational phase road traffic emissions impact assessment on the B4668 Leicester Road in closer proximity to the road network, than Burbage Woods and Common and are therefore considered suitable proxy locations to consider the impact of the Development once operational on local air quality in the area. Details are provided within the Assessment Methodology section of this Chapter and shown in Figures 9.1 and 9.3-9.11.
Consultation	Discussions with Blaby District Council (BDC) and Hinckley and Bosworth District Council (HBBC) over the methodology should be documented in the ES.	Further consultation has been undertaken with BDC and HBBC to discuss the methodology and sensitive receptors. This was agreed and is detailed within Table 9.3 of this Chapter.

Secretary of State	Scoping Opinion Response	Response to Comments
Temporal Scope of the Assessment	The Scoping Report states that assessments will be carried out for the baseline year and a future assessment year but does not explain what the future assessment year would be. The ES should ensure that the choice of future assessment year is based on a worst case scenario.	The opening year of the Proposed Development is confirmed as 2026 for the purposes of the assessment in the ES. A future year of 2036 was chosen early on in the development proposals as 10 years ahead of opening year rather than the end of the Blaby plan period (2038). The transport model does not encompass a 2038 assessment year, only up to 2036 and National Highways (NH) advised that 2036 is a suitable proxy.

Table 9.2: Consultee comments

Consultee	Comments	Response
Blaby District Council (BDC)	The effects of dust generation should be considered in the assessment of the impacts for the construction phase. Air quality and dust levels should be considered not only on site but also off-site, including along access roads, local footpaths and other Public Rights of Way (PRoWs). Any mitigation measures necessary to deal with adverse impacts and identify any residual effects should clearly be defined. Consideration should be given to monitoring dust complaints.	The assessment considers construction phase impacts in accordance with guidance produced by the Institute of Air Quality Management (IAQM) and is contained within this Chapter. Further information on the construction dust assessment is also contained within Appendix 9.3.
Burbage Parish Council	The ES should include a full study of the impact assessment of increased traffic on local air quality. The study should include the impact of traffic congestion upon air quality.	This Chapter considers the impact of operational phase road traffic emissions on local air quality. Consideration of traffic speeds and highways elevations have been considered within the assessment which was undertaken in accordance with relevant guidance.

Consultee	Comments	Response
		A quantitative construction phase road traffic emissions assessment was not undertaken as part of the PEIR as phasing is subject to further detailed considerations and indicative construction traffic numbers for local roads provided by the Project Transport Consultant are below the DMRB criteria for when a detailed assessment is required. Construction phase traffic will be considered further in the ES accompanying the DCO application.
	The ES should not base air quality assumptions upon the reduction of diesel and petrol vehicles which mitigates potential air quality reductions locally from the operation of this development. Local air quality should benefit from the increase in electric vehicles by a [sic] increase in air quality compared to current levels.	The air quality assessment used the latest emission factors from the DEFRA Emissions Factor Toolkit (EFT), version 10.1 and was undertaken in accordance with relevant guidance. The EFT toolkit uses the latest emission factors and is based on real world car sale projections in 2019 from the Department for Transport (DfT). The assessment methodology was agreed with the Environmental Health departments at Blaby District Council (BDC) and Hinckley and Bosworth Borough Council (HBBC).
Elmesthorpe Parish Council	The Parish Council notes that since the original Scoping Report, the NO_2 data from a diffusion tube on Station Road Elmesthorpe is to be taken into account. However the construction dust assessment appears to be proposed for properties within 350m of the site only, and bearing in mind the size of the development this seems inadequate, and we would wish to see the detailed justification for assessment of such a small area, or preferably that the area being assessed should be extended in the ES.	Local authority diffusion tube data contained within the study area is shown within Appendix 9.9. The construction phase dust assessment was undertaken in accordance with guidance produced by the IAQM. This allowed the determination of the sensitivity of the area and dust emission magnitudes based on those receptors which will experience the greatest impacts. The construction phase dust assessment is contained within the Potential Significant Effects of the Proposals section of this Chapter and further information is contained in Appendix 9.3.

Consultee	Comments	Response
	At paragraph 8.76, the Applicant states that a detailed assessment of plant emissions are proposed to be scoped out of the assessment as "they are not considered to be likely to give rise to significant effects". The Parish Council does not agree and would wish to see a detailed assessment in the ES.	Information regarding the potential nature of the energy facility is provided within the Assessment Methodology section of this Chapter. A detailed assessment of the energy facility emissions was not undertaken as part of the PEIR as detailed information was not available at the time of assessment. Air dispersion modelling of emissions from the energy facility is proposed as part of the ES.
National Highways (NH)	Adverse change to noise and air quality should be particularly considered, including in relation to compliance with the European air quality limit values and/or in any local authority designated Air Quality Management Areas (AQMAs).	The impact of the proposals on local air quality was assessed in accordance with relevant guidance. The predicted changes in pollutant concentrations were compared to the relevant air quality objectives and designated AQMAs were considered where necessary.
Hinckley and Bosworth District Council	The Scoping Report identifies relevant policy and legislation relating to air quality. Paragraph 8.12 states there are no relevant policies relating to air quality in the HBBC Core Strategy, however Spatial Objective 12: Climate Change and Resource Efficiency is relevant.	Spatial Objective 12 was considered within the relevant policy and legislation section of this Chapter and further information can be found in Appendix 9.2.
Natural England (NE)	Air quality in the UK has improved over recent decades but air pollution remains a significant issue; for example over 87% of sensitive habitat area in England is[sic] predicted to exceed the critical loads for ecosystem protection from atmospheric nitrogen deposition. A property action in the England Biodiversity Strategy is to reduce air pollution impacts on biodiversity. The planning system plays a key role in determining the location of developments which may give rise to pollution, either directly or from traffic generation, and hence	This Chapter includes an assessment of the impact of the Proposed Development on designated ecological sites identified within the study area. Full results of the ecological assessment can be found in Appendix 9.12 and are discussed within the Potential Significant Effects of the Proposals section of this Chapter.

Consultee	Comments	Response
	planning decisions can have a significant impact on the quality of air, water and land. The assessment should take account of the risks of air pollution and how these can be managed or reduced. Further information on air pollution impacts and the sensitivity of different habitats/designated sites can be found on the Air Pollution Information System (APIS). Further information on air pollution modelling and assessment can be found on the Environment Agency (EA) website.	
Public Health England	When considering baseline conditions and the assessment of future impacts, these should include: • Consideration of impacts on existing areas of poor air quality e.g. existing or proposed local authority AQMAs • Modelling using appropriate meteorological data • Modelling taking into account local topography, congestion and acceleration • Evaluation of the public health benefits of development such as nitrogen dioxide (NO_2) or particulate matter (PM) show no threshold below which health effects do not occur.	This Chapter has considered the baseline conditions and future operational phase road traffic emissions impact upon pollutant concentrations at existing receptors within the study area. The air quality modelling considered receptors within AQMA's in the study area and utilised appropriate meteorological data considered to be representative of the broad study area. The use of the meteorological data was agreed during consultation with BDC and HBBC. Traffic speeds and local topography were also considered within the assessment. The assessment considered the impact of development on sensitive human receptors utilising the most recent guidance and relevant air quality objectives at the time.

9.8. Further to the Scoping Report consultation, consultation was also undertaken with the Environmental Health departments at Blaby District Council (BDC) and Hinckley and Bosworth Borough Council (HBBC) to agree the proposed air quality assessment (AQA) methodology. Table 9.3 provides a summary of the consultation undertaken.

Table 9.3: Consultation responses relevant to this Chapter

Consultee	Date	Comments	Actions
Blaby District Council Environmental Health Department	17/06/2021	Consultation email detailing proposed assessment methodology and receptor locations issued to BDC for review.	None
	17/06/2021	Confirmation of acceptance of methodology received from BDC by email.	None
Hinckley and Bosworth Borough Council Environmental Health Department	17/06/2021	Consultation email detailing proposed assessment methodology and receptor locations issued to HBBC for review.	None
	18/06/2021	Confirmation of acceptance of methodology received from HBBC by email.	None

9.9. A public consultation exercise was also undertaken in 2018/2019 where air quality was discussed with the public. Concerns were raised regarding potential air quality impacts and this chapter considers potential impact of the Proposed Development on local air quality.

Assessment methodology

Construction phase dust assessment

9.10. An assessment of the potential impacts from the construction of the Proposed Development was undertaken in accordance with IAQM guidance[22]. The guidance sets out principles to determine the sensitivity of the area and dust emission magnitudes based on those receptors which will experience the maximum impact. The full assessment methodology is provided in Appendix 9.3 and a summary of the assessment steps are provided below:

- Step 1 - screen the requirement for a more detailed assessment. No assessment is required if there are no receptors within a certain distance of the works;
- Step 2 - assess the risk of dust impacts separately for each of the four activities considered (demolition, earthworks, construction and trackout);
    - Step 2A- determine the potential dust emission magnitude for each of the four activities;
    - Step 2B- determine the sensitivity of the area;
    - Step 2C- determine the risk of dust impacts by combining the findings of steps 2A and 2B.
- Step 3 - determine the site-specific mitigation for each of the four activities; and

- Step 4 - examine the residual and in combination effects and determine significance.

Study area and identification of existing sensitive receptors

9.11. Existing sensitive receptors were identified within the distance bands detailed in the IAQM guidance[22] and considered with regard to dust soiling, human health effects and ecological designated sites. Figure 9.1 details the construction phase dust distance buffers which are measured at 20m, 50m, 100m, 200m and 350m from the Order Limits and represent the extents of the construction phase dust assessment.

9.12. The distance bands provided by the IAQM guidance[22] '*are deliberately chosen to be conservative and take into account the exponential decline in both airborne concentrations and the rate of deposition of dust with distance from the source'*.

9.13. Sensitive receptors for construction dust were identified based on the criteria above.

Construction phase road traffic emissions

9.14. The Design Manual for Roads and Bridges (DMRB) LA105[21] states that emissions from construction vehicles on the local road network should be considered where construction is predicted to last for more than six months. The criteria provided in DMRB LA105 stipulates that further assessment of vehicle emissions is required where a change in flow of 1,000 as a 24 hour annual average daily traffic (AADT) movements or more is expected, or the heavy-duty vehicle (HDV) flow will change by 200 AADT or more.

9.15. A quantitative construction phase road traffic emissions assessment was not undertaken as part of the PEIR as phasing is subject to further detailed considerations and indicative construction traffic numbers for local roads provided by the Project Transport Consultant are below the DMRB criteria for when a detailed assessment is required. Construction phase traffic will be considered further in the ES accompanying the DCO application.

9.16. Further details are provided in Chapter 8: *Transport and Traffic*.

Operational phase road traffic emissions assessment

9.17. A detailed assessment of operational phase road traffic emissions on local air quality was undertaken in accordance with DMRB LA105[21], with reference to DEFRA air quality technical guidance[20], IAQM and EPUK guidance[23] and National Policy Statement (NPS) for National Networks guidance[15].

9.18. Atmospheric Dispersion Modelling System ('ADMS') ADMS-Roads, version 5.0.0.1, was utilised in the assessment to predict concentrations of oxides of nitrogen ('NO_x') and varying sizes of particulate matter ('PM_{10}' and '$PM_{2.5}$') at identified existing human receptor locations and within the designated ecological sites identified within the study area.

Study area and identification of existing receptor locations

9.19. The study area was determined in accordance with the criteria provided by DMRB LA 105

Air Quality guidance[21]. In accordance with DMRB LA105, the screening criteria for the 'affected road network' is:

- a change in alignment of more than 5m or more; or
- a change in daily traffic flows of 1,000 AADT or more; or
- a change in heavy duty vehicles (HDVs) flows of 200 AADT or more; or
- a change in speed band.

9.20. Traffic data provided by the project's Transport Consultants, as set out in Chapter 8: *Transport and Traffic* was screened in accordance with these criteria to identify affected road links and the extent of the study area. Additional traffic data for roads in the vicinity of receptors or monitoring locations was included if required for assessment purposes.

9.21. Existing human receptor locations were identified within the study area and concentrations of nitrogen dioxide (NO_2), PM_{10} and $PM_{2.5}$ were predicted at these receptors in the operational phase road traffic emissions assessment.

9.22. The extent of the study area for the operational phase road traffic emissions assessment is shown in Figure 9.2, and the receptor locations included within the operational phase road traffic emissions assessment are depicted in Figures 9.3-9.11.

9.23. The existing human sensitive receptor locations considered in the assessment were based on their relative proximity to road links within the study area. Where possible the closest receptors to those road links and junctions were considered, as these receptors are likely to experience the greatest change in pollutant concentrations as a result of the Proposed Development. The receptors were located on the facades of the properties closest to the road source.

9.24. The existing human receptor locations are detailed in Appendix 9.4 and Figures 9.3-9.8. Pollutant concentrations were predicted at the height representative of exposure. Ground floor receptors were modelled at a height of 1.5 metres (m). This excludes schools and nurseries, which were modelled at 0.8m to represent a lower than average breathing height for children.

9.25. Receptors relevant to the short term objectives were also identified. These receptors were located where members of the public could be present for a period of time comparable to the short term air quality objectives, but unlikely to be present for extended periods such as those representative of the annual air quality objectives. Such uses include hotels or restaurants.

9.26. Receptors were considered within the following Local Authority areas:

- Blaby District Council (BDC);
- Hinckley and Bosworth Borough Council (HBBC);

- Rugby Borough Council (RBC);
- Harborough District Council (HDC);
- Charnwood Borough Council (CBC);
- Erewash Borough Council (EBC);
- North Warwickshire Borough Council (NWBC);
- North West Leicestershire Council (NWLC);
- Coventry City Council (CCC);
- Tamworth Borough Council (TBC);
- Nuneaton and Bedworth Borough Council (NBBC); and
- West Northamptonshire Council (Daventry District Council (DDC)) (WNC).

Ecological designations

9.27. Ecological designations, including Sites of Special Scientific Interest (SSSI), Special Areas of Conservation (SAC), Local Nature Reserves (LNR) and Ancient Woodlands (AW), were considered within the assessment where they were located within 200m of the affected road network in accordance with the DMRB LA105 criteria[21]. The locations of the ecological designations are depicted in Figures 9.9-9.11.

Ecological critical load and level assessment

9.28. The dispersion modelling software ADMS-Roads was utilised to predict concentrations of NOx and nitrogen deposition resulting from additional development-generated road traffic emissions within the ecological sites. Transects were modelled at 10m intervals from the boundary of each designated ecological site adjacent to affected roads, up to 200m into the ecological site in accordance with IAQM[24] and DMRB guidance[21].

9.29. Figures 9.9-9.11 detail the ecological designations in which transects were modelled. Further details are also provided in Appendix 9.5.

Rail emissions

9.30. DEFRA guidance[20] provides a screening criterion for both stationary and moving diesel locomotives, which set out when a more detailed assessment of rail emissions may be required. Rail emissions were considered within the assessment in accordance with this guidance.

Identification of existing receptor locations

9.31. The rail emissions were considered using DEFRA guidance[20]. The guidance provides the

following criterion to consider whether an assessment of rail emissions is required:

- where relevant sensitive exposure locations lie within 15m of stationary locomotives; or
- where relevant sensitive exposure locations lie within 30m of identified high diesel usage lines as defined in DEFRA guidance.

Energy centre flue emissions

9.32. It is understood that power for the development will be provided through an enhanced grid supply and the capacity will be augmented with on-site renewable generation from rooftop Photovoltaics (PV). The Proposed Development also includes plans for an energy centre comprising Combined Heat and Power (CHP) generated from gas. At the time of assessment, the energy plant to be installed on the Main HNRFI Site was not sufficiently progressed to enable a quantitative assessment to be undertaken. Therefore, emissions associated with on-site energy generation were not considered further within this assessment at this time. This will be addressed through the ES in time for submission of the application, where sufficient information is available.

Sensitivity of receptors

Construction phase dust emissions

9.33. Existing receptors are located within 350m of the Order Limits. These receptors comprise a variety of sensitivities which are defined using the IAQM guidance[22] and are presented in Table 9.4.

Table 9.4: Receptor sensitivity

Receptor Sensitivity	Rationale	Example Uses
High	Surrounding land where users can reasonably expect to enjoy a high level of amenity or the appearance, aesthetics or value of their property would be diminished by soiling. The people or property would reasonably be expected to be present continuously, or at least regularly for extended periods of time.	Highly sensitive receptors within 350m of the Order Limits include residential dwellings and medium term car parks
Medium	Users would expect to enjoy a reasonable level of amenity, but would not reasonably expect to enjoy the same level of amenity as in their home, or the appearance, aesthetics or value of their property could be diminished by soiling. The people or property wouldn't reasonably be expected to be present here continuously or regularly for extended periods of time as part of their normal pattern of	Medium sensitive receptors within 350m of the Order Limits include Burbage Common and Woods, Aston Firs SSSI and public rights of way (PRoWs).

Receptor Sensitivity	Rationale	Example Uses
	use.	
Low	The enjoyment of amenity would not be reasonably expected or property would not be reasonably be expected to be diminished in appearance, aesthetics or value by soiling. There is transient exposure where people or property would be reasonably only be expected to be present only for limited periods of time as part of the normal pattern of use of the land.	Low sensitivity receptors within 350m of the Order Limits include roads.

9.34. The construction phase dust assessment was undertaken using the most sensitive receptor classification within the appropriate distance bands to the Order Limits. The closest human receptors are residential dwellings on Smithy Lane, Leicester Road and Station Road (Figures 9.3-9.8**)**. These receptors are considered to be highly sensitive for both dust soiling and human health impacts in accordance with IAQM guidance[22]. Car parking for the Burbage Common and Woods Country Park is considered to be highly sensitive to dust soiling. Initial phases of the Proposed Development will also constitute sensitive receptors to the ongoing construction work.

9.35. The closest ecological receptors identified within 20m of the Order Limits, in accordance with the IAQM guidance[22], are the Burbage Common and Woods and Aston Firs SSSI. These are considered to be medium sensitivity receptors to dust soiling following advice from the appointed ecological consultants, EDP.

Operational phase road traffic emissions

Human receptors

9.36. All receptors identified and considered in the assessment were classified as residential, educational or medical in nature and were therefore considered to be highly sensitive.

Ecological receptors

9.37. International, national or local ecological designated sites are considered sensitive receptors in accordance with DMRB guidance[21].

Assessment scenarios and traffic data

9.38. Traffic data for the assessment scenarios was provided by the appointed transport consultants for the Proposed Development. The data was obtained from the Pan Regional Transport Model 2 (PRTM2.2) which was provided by AECOM. 24-hour AADT and HDV flows and average speeds were provided for the roads shown in Figure 9.2.

9.39. The following scenarios were considered in the air dispersion modelling:

- Scenario 1: Base and Model Verification Year (2019);
- Scenario 2: Opening Year (2026) Without Development;
- Scenario 3: Opening Year (2026) With Development;
- Scenario 4: Future Year (2036) Without Development; and
- Scenario 5: Future Year (2036) With Development.

9.40. The Proposed Development includes the creation of new slip roads at junction 2 of the M69, alongside a new link road through the Main HNRFI Site from junction 2 of the M69 to the B4668 Leicester Road. The assessment therefore considers the new road geometry for the With Development scenarios. Other proposed off-site highway works are minor, do not result in changes in traffic movements and were therefore not explicitly included in the traffic data utilised in air dispersion modelling for the PEIR.

9.41. Committed developments were included in the traffic data provided for the Opening Year and Future Year scenarios to enable consideration of cumulative effects associated with simultaneous operation of all developments. Details of committed developments considered in the assessment are set out in Chapter 8: *Transport and Traffic*.

9.42. A number of roads within the study area are elevated, including railway bridges and motorways, and therefore these sections were elevated in the dispersion model to replicate road geometry. As precise road elevations were not available, elevated road sections were modelled at a height of 5m, which is the minimum height for unmarked road bridges in accordance with Driver & Vehicle Standards Agency (DVSA) guidance[1]. The use of 5m as an elevated road height represents a conservative assessment as it locates the emission source at the closest possible height to the receptors modelled in the assessment.

Assessment inputs and calculations

9.43. The following inputs were utilised in the assessment:

- Emission Factors - emission factors were utilised from the DEFRA Emission Factor Toolkit, version 10.1[2], for the years of assessment (2019, 2026 and 2036). 2030 emissions factors were used for the 2036 scenarios as this is the latest year for which emission factors were derived by DEFRA at the time of assessment.
- Conversion of oxides of nitrogen - concentrations of NOx were predicted using the ADMS-Roads dispersion model. These concentrations were converted to NO_2 using

[1] Driving & Vehicle Standards Agency (DVSA) (2016) The Official DVSA guide to driving buses and coaches
[2] DEFRA (2020) Emission Factor Toolkit [https://laqm.defra.gov.uk/review-and-assessment/tools/emissions-factors-toolkit.html]

the DEFRA NOx to NO_2 calculator, version 8.1[3].

- Meteorological Data - hourly sequential meteorological data for the base and verification year of assessment (2019) were obtained from the East Midlands Airport recording station as agreed with BDB and HBBC during consultation. This is the closest, most representative recording station to the Proposed Development. The wind rose for 2019 is provided in Appendix 9.6.

- Surface roughness - a surface roughness of 0.75 was utilised in the dispersion model. This is representative of the wider study area, which includes a variety of environments including urban areas such as Hinckley, Narborough and Atherstone, woodland, rural environments and open fields.

- Monin-Obukhov length (MO) - a MO of 30 was utilised in the dispersion model. This is representative of the Main HNRFI Site location and surrounding area which is mix of urban areas, woodland and open fields.

- DEFRA background maps[4] - background concentrations of NOx, NO_2, PM_{10} and $PM_{2.5}$ were obtained for use in the assessments. All were obtained from the pollutant concentration maps provided by DEFRA. The DEFRA pollutant concentration maps are provided as 1 kilometre (km) x1km grids squares of the UK and were obtained for the years of assessment (2019, 2026 and 2036). 2030 data was used for the 2036 scenarios as this is the latest year for which background mapped concentrations were derived by DEFRA at the time of assessment. The background concentrations used within the assessment are detailed in Appendix 9.7.

- Air Pollution Information System (APIS)[5] - APIS provides critical loads for ecological habitats and was utilised to obtain nitrogen deposition values relevant for the ecological sites within the study area. Nitrogen deposition values for ecological habitats not included within APIS were obtained from the appointed ecological consultants for ecological sites within the study area.

- Model verification - model verification was undertaken using 2019 local authority monitoring data for the study area. Full details of the verification procedure are provided in Appendix 9.8. 2020 monitoring data was available at the time of assessment however, due to the influence of COVID-19 pandemic lockdown restrictions on traffic levels in 2020, monitoring undertaken in 2020 would not be considered representative of 'typical' conditions. Model verification was therefore undertaken utilising 2019 monitoring data as the last year of 'typical' monitoring data, in accordance with the IAQM position statement[6].

[3] DEFRA (2020) NOx to NO2 Calculator [https://laqm.defra.gov.uk/review-and-assessment/tools/background-maps.html#NOxNO2calc]
[4] DEFRA (2020) background pollutant concentration maps [https://uk-air.defra.gov.uk/data/laqm-background-maps?year=2018]
[5] Air Pollution Information System (APIS) [http://www.apis.ac.uk/]
[6] IAQM (2021) Use of 2020 and 2021 Monitoring Datasets

- Calculation of short term PM_{10} concentrations - the following calculation, as detailed in DEFRA guidance was utilised to calculate the number of exceedances of the 24-hour mean PM_{10} air quality objective.

  *Number of 24-hour Mean Exceedances = -18.5 + 0.00145*Annual Mean^3 + (206/Annual Mean)*

- Nitrogen deposition conversion - NOx concentrations predicted within each of the ecological sites were converted to deposition values using the relevant deposition conversions as provided in DMRB guidance[21].

Assessment criteria, characterisation of impact and significance criteria

Construction phase dust assessment

9.44. The construction dust assessment was undertaken in accordance with IAQM guidance[22]. The assessment criteria used to undertake the assessment steps is detailed in paragraph 9.9 and provided in Appendix 9.3.

Operational phase road traffic emissions assessment

9.45. Predicted pollutant concentrations at existing human receptor locations were compared to the relevant air quality objectives. The current relevant air quality standards and objectives are detailed in Table 9.5.

Table 9.5: Air quality standards and objectives (England)

Pollutant	Averaging Period	Air Quality Objective ($\mu g.m^{-3}$)	Date to be Achieved by
NO_2	Annual Mean	40	31 December 2005
	1-hour mean not to be exceeded more than 18 times per year	200	31 December 2005
PM_{10}	Annual Mean	40	31 December 2004
	24-hour mean not to be exceeded more than 35 times per year	50	31 December 2004
$PM_{2.5}$	Annual mean target (15% cut in annual mean urban background exposure)	25	2010-2020

Critical levels

9.46. The current relevant annual mean Critical Level for NOx for the protection of vegetation

and ecosystems, as transposed into UK law by the Air Quality Standards and Regulations 2010, as amended, are detailed in Table 9.6.

Table 9.6: Annual mean critical level for the protection of vegetation and ecosystems

Pollutant	Averaging Period	Critical Level (µg.m^{-3})
NO_x	Annual Mean	30

Critical loads

9.47. The level of nitrogen deposition calculated across the transect points within the designated ecological sites were compared to the lower critical load value to determine whether changes in nitrogen deposition were greater than 1% of the critical load. The critical loads utilised within the assessment are detailed in Table 9.7.

Table 9.7: Nitrogen deposition critical loads utilised in the assessment

Ecological Site	Critical Load (kg N ha^{-1}yr^{-1})
Alvecote Pools SSSI	20-30
Ashlawn Cutting LNR	10-20
Aston Firs SSSI	15-20
Bramcote Covert AW	10-20
Burbage LNR	10-15
Cave's Inn Pits SSSI	20-30
Daniels Wood AW	10-20
Free Holt Wood AW	10-20
Grendon Wood AW	10-20
Kettle Brook LNR	10-20
Lount Meadows SSSI	20-30
Many Lands Wood AW	10-20
Martinshaw Wood AW	5-15
Martinshaw Wood South AW	10-20
Narborough Bog SSSI	10-20
Oakley Wood SSSI	15-20
Piper Wood AW	10-20
River Mease SAC/SSSI	No data available
Shawell Wood AW	10-20
Sparrowdale Wood AW	10-20
Sparrowdale Wood AW	10-20
Tonge Gorse AW	10-20
Wyken Slough LNR	10-15

9.48. To provide a conservative assessment, the changes in nitrogen deposition were calculated as a percentage of the lower critical load for each site.

9.49. The assessment of likely significant environmental effects as a result of the Proposed Development took into account the construction and operational phases of the Development.

Construction phase dust assessment

9.50. Any impacts associated with the construction of the Proposed Development are likely to be local, medium term and temporary in nature. The significance of any impacts were identified in accordance with IAQM guidance[22].

9.51. Step four of the IAQM guidance examines the residual effects of the Proposed Development and states *'for almost all construction activity, the aim should be to prevent significant effects on receptors through the use of effective mitigation'.*

9.52. The assessment is used to define appropriate mitigation measures to minimise any potential effect.

Operational phase road traffic emissions assessment

9.53. Any impacts associated with operational phase road traffic emissions are likely to be local, long term and permanent in nature. Impacts will be positive or negative depending on whether an increase or decrease in development-generated vehicle movements is experienced on the local road network. The significance of any impacts were identified in accordance with reference to the criteria provided by IAQM and EPUK guidance[23] and DMRB LA105[21].

Human receptors – IAQM and EPUK guidance

9.54. The impact of the Proposed Development is determined with regard to the percentage change in pollutant concentrations relative to the relevant Air Quality Assessment Level. Predicted pollutant concentrations are compared to the relevant air quality objectives (as detailed in Table 9.5) and the significance of the impact determined with regard to IAQM and EPUK guidance[23]. Guidance is provided by the IAQM and EPUK to determine the significance of the impact of development-generated road traffic emissions on local air quality. The impact descriptors at human receptor locations are detailed in Table 9.8 and were adjusted to the magnitude descriptors used within Environmental Impact Assessments (EIAs). These impact descriptors consider the predicted magnitude of change in pollutant concentrations and the concentration in relation to the relevant air quality objectives (as detailed in Table 9.5).

Table 9.8: IAQM impact descriptors for individual receptors

Long Term Average Concentrations at Receptor in the Assessment Year	% Change in Concentration Relative to Air Quality Assessment Level (AQAL)			
	1%	2-5%	6-10%	>10%
<75% of AQAL (<30µg.m^{-3})	Negligible	Negligible	Minor	Moderate
76-94% of AQAL (30-38µg.m^{-3})	Negligible	Minor	Moderate	Moderate
95-102% of AQAL (38-41µg.m^{-3})	Minor	Moderate	Moderate	Major
103-109% of AQAL(41-44µg.m^{-3})	Moderate	Moderate	Major	Major
>110% (>44µg.m^{-3})	Moderate	Major	Major	Major

Note: Figures rounded to the nearest whole number, therefore any values less than 1% after rounding (effectively less than 0.5%) will be described as negligible.

9.55. For each effect, it was concluded whether the effect is 'beneficial' or 'adverse'.

9.56. The following terms were used to define the significance of the effects identified and these can be 'beneficial' or 'adverse':

- Major effect: where the Proposed Development is likely to cause a considerable change from the baseline conditions and the receptor has limited adaptability, tolerance or recoverability or is of the highest sensitivity. This effect is considered 'Significant'.

- Moderate effect: where the Proposed Development is likely to cause either a considerable change from the baseline conditions at a receptor which has a degree of adaptability, tolerance or recoverability or a less than considerable change at a receptor that has limited adaptability, tolerance or recoverability. This effect is considered more likely to be 'Significant' but will be subject to professional judgement.

- Minor effect: where the Proposed Development is likely to cause a small, but noticeable change from the baseline conditions on a receptor which has limited adaptability, tolerance or recoverability or is of the highest sensitivity; or where the Proposed Development is likely to cause a considerable change from the baseline conditions at a receptor which can adapt, is tolerant of the change or/and can recover from the change. This effect is considered to be 'Not Significant' but will be subject to professional judgement.

- Negligible: where the Proposed Development is unlikely to cause a noticeable change at a receptor, despite its level of sensitivity or there is a considerable change at a receptor which is not considered sensitive to a change. This effect is 'Not Significant'.

9.57. In accordance with IAQM and EPUK guidance, 'Minor' and 'Negligible' level effects were

considered 'Not Significant', whilst 'Moderate' or 'Major' level effects were considered to be potentially 'Significant'. A statement is made as to whether the level of effect is 'Significant' or 'Not Significant'.

Human receptors – DMRB guidance

9.58. DMRB LA105 guidance[21] sets out magnitudes of change in annual concentrations of NO_2, PM_{10} and $PM_{2.5}$ to categorise a significant effect for receptors where the concentration of a pollutant is within 10% of the relevant objective with the Proposed Development. The magnitude of change criteria is presented in Table 9.9.

Table 9.9: Magnitude of change criteria

Magnitude of Change in Concentration ($\mu g.m^{-3}$)	Value of Change in Annual Average NO_2 and PM_{10}
Large (>4)	Greater than 10% of the air quality objective
Medium (>2-4)	Greater than 2$\mu g.m^{-3}$ but less than 10% of the objective (4$\mu g.m^{-3}$)
Small (>0.4 to 2)	Greater than 1% of the objective (0.4$\mu g.m^{-3}$) but less than 5% of the objective (2$\mu g.m^{-3}$)
Imperceptible (≤ 0.4)	Less than equal to 1% of the objective (0.4$\mu g.m^{-3}$)

9.59. Where DMRB LA105[21] is applied, changes in pollutant concentrations greater than imperceptible (0.4$\mu g.m^{-3}$) at each receptor based on the Without Development versus With Development model results, are compared with guideline bands that inform the potential significance of the impact of the Proposed Development. The guideline band ranges are presented in Table 9.10 and provide the upper level of likely non-significance and the lower level of likely significance. Between these two levels are the ranges where likely significance is more uncertain, and greater onus is afforded to professional judgement.

Table 9.10: Guideline to number of properties constituting a significant effect

Magnitude of Change (µg.m^{-3})	Number of Receptors Demonstrating:	
	Worsening of air quality that already exceeds objective, risk of exceeding objective or creation of new exceedance	Improvement of air quality that already exceeds objective, risks of exceeding objective or the removal of existing exceedances
Large (>4)	1 to 10	1 to 10
Medium (>2 to 4)	10 to 30	10 to 30
Small (0.4 to 2)	30 to 60	30 to 60

9.60. Significant air quality effects are only identified for those receptors where air quality thresholds are exceeded or at risk of being exceeded in the without and/or With Development scenarios. Whilst the approach contained within DMRB LA105[21] focuses on receptors already exceeding an annual mean air quality objective, or within 10% of exceeding an objective, guidance for determining the impact of the operational phase of the Proposed Development on each individual local air quality sensitive receptors is provided by the IAQM guidance as detailed in Table 9.8.

Ecological designations

9.61. The NOx concentrations predicted at the transect points within the ecological sites, were compared to the relevant critical level, as detailed in Table 9.6, to determine any exceedances.

9.62. The level of nitrogen deposition calculated across the transect points within the ecological sites were compared to the lower relevant critical load value to determine whether changes in nitrogen deposition were greater than 1% of the critical load. The results were referred to the appointed ecological consultants, to determine any potential impacts. Further details are provided in Chapter 12: *Ecology and Biodiversity*.

Limitations and assumptions

9.63. Information on the precise number of vehicle movements during the construction phase, specific traffic management measures and the exact location of construction site entrances were not available at the time of assessment. The availability of this information will be addressed in the ES, and where applicable, this will be incorporated into the construction phase assessment.

9.64. At the time of assessment, detailed information on the energy plant to be installed at the Main HNRFI Site was not sufficiently progressed to enable a quantitative assessment to be undertaken. Therefore, energy plant were not considered further within this assessment at this time. This will be addressed through the ES in time for submission of the application, where the relevant information is available for consideration.

9.65. There are uncertainties associated with both measured and predicted pollutant concentrations. The model (ADMS-Roads) used in this assessment relies on input data (including predicted traffic flows), which are also subject to uncertainty. The model itself simplifies complex physical systems into a range of algorithms. In addition, local microclimatic conditions may affect the concentrations of pollutants that the ADMS-Roads model will not take into account.

9.66. The air quality assessment level is based on traffic data provided by AECOM for the PRTM2.2 Model. As such any assumptions made within the PTRM2.2 model are included within the AQA.

9.67. In future year scenarios, uncertainty relates to the projection of vehicle emissions and in particular, the rate at which emissions per vehicle will improve over time. This assessment utilised the most recent version of DEFRA's Emission Factors Toolkit to provide the most up to date estimate of current and future emission projections.

9.68. Current projections for vehicle emission factors are only available until 2030, which precedes the 2036 future year scenarios. Therefore, vehicle emission factors adopted for this year were based on 2030 emission factors, which is considered to be conservative.

9.69. To reduce uncertainty associated with predicted concentrations, model verification was carried out following guidance set out in DEFRA guidance. As the models were verified using local monitoring data and adjusted accordingly, there can be reasonable confidence in the predicted concentrations.

RELEVANT LAW, POLICY AND GUIDANCE

National Legislation and Planning Policy

9.70. The following national legislation and planning policy is relevant to air quality and was considered in the undertaking of the assessment. A summary of the relevant national legislation and planning policy is provided in Appendix 9.2:

- European Parliament, EU 2008 Ambient Air Quality Directive (2008)[7];
- HMSO, Air Quality (England) Regulations (2000)[8];
- HMSO, Environment Act (1995)[9];
- HMSO, Environment Act (2021)[10];

[7] European Parliament (2008) Council Directive 2008/50/EC on Ambient Air Quality and Cleaner Air for Europe
[8] HMSO (2000) Statutory Instrument 2000 No. 928, The Air Quality (England) Regulations 2000 (as amended), London: HMSO
[9] HMSO (1995) The Environment Act 1995, London: TSO
[10] HMSO (2021) The Environment Act 2021, London: TSO

- Department for the Environment, Food and Rural Affairs (DEFRA), Air Quality Strategy (AQS) (2007)[11];
- Ministry of Housing, Communities and Local Government (MHCLG), National Planning Policy Framework (NPPF) (2021)[12];
- National Planning Policy Framework[13]; and
- Planning Practice Guidance[14].
- National Policy Statement (NPS) for National Networks (2014)[15]

Local Planning Policy

Local Plan Policy

9.71. The following local planning policy was considered in the undertaking of the assessment and a summary is provided in Appendix 9.2:

- Blaby District Local Plan Adopted Core Strategy[16];
- Hinckley and Bosworth Local Development Framework (LDF) Core Strategy[17] ;
- Rugby Local Plan[18]; and
- Harborough Local Plan[19].

Air Quality Guidance

9.72. The following guidance was used in the AQA:

- DEFRA, Local Air Quality Management Technical Guidance (LAQM TG(16)) (2021)[20];
- Highways England (HE), Design Manual for Roads and Bridges (DMRB) LA105 Air

[11] Department of the Environment, Food and Rural Affairs (DEFRA) (2007) The Air Quality Strategy for England, Scotland, Wales and Northern Ireland, London: HMSO
[12] Ministry of Housing, Communities & Local Government (2021) National Planning Policy Framework, HMSO London
[13] Ministry of Housing, Communities & Local Government (2019) National Planning Policy Framework, HMSO London
[14] Department for Communities and Local Government (2019) Planning Practice Guidance Air Quality
[15] Department for Transport (DfT) (2014) National Planning Policy Statement for National Networks, HMSO London
[16] Blaby District Council (2013) Adopted Core Strategy
[17] Hinckley and Bosworth Borough Council (2016) Local Development Core Strategy
[18] Rugby Borough Council (2019) Rugby Borough Council Local Plan 2011-2031
[19] Harborough District Council (2019) Harborough Local Plan 2011-2031
[20] DEFRA (2021) Local Air Quality Management Technical Guidance (LAQM TG(16))

Quality guidance (2019)[21];

- Institute of Air Quality Management, Guidance on the assessment of dust from demolition and construction (2014)[22];
- Institute of Air Quality Management and Environmental Protection UK, Land-Use Planning and Development Control: Planning for Air Quality (2017)[23]; and
- Institute of Air Quality Management, A Guide to the Assessment of Air quality Impacts on Designated Nature Conservation Sites (2020)[24].

BASELINE CONDITIONS

9.73. This section summarises the characteristics of the existing air quality conditions within the study area. The study area encompasses eleven different local authority areas and details of baseline air quality conditions in these areas are provided. Diffusion tube monitoring data for each local authority for within the study area can be found in Appendix 9.9.

9.74. Principal air pollution sources in the vicinity of the Order Limits are likely to comprise road traffic emissions with the M69, M6 and A5 all within the study area.

Air quality review and assessment

9.75. This section provides a summary of baseline conditions assessment across the Blaby District Council (BDC), Hinckley and Bosworth Borough Council (HBBC) Rugby Borough Council (RBC) and Harborough District Council (HDC) administrative areas.

9.76. The information contained in this section was correct at the time of assessment.

The Site

9.77. The Order Limits are located within the administrative areas of BDC, HBBC, HDC and RBC. The Order Limits are not located within, or in the vicinity of, any Air Quality Management Areas (AQMAs).

Blaby District Council

9.78. BDC declared five AQMAs for the potential exceedance of the annual mean NO_2 objective. AQMA 2 and 3 both fall within the study area as shown in Figure 9.8. AQMA 2 is located along the M1 corridor between Enderby and Narborough and AQMA 3 covers the M1

[21] Highways England, (2019), Design Manual for Roads and Bridges LA 105 Air Quality
[22] Institute of Air Quality Management (2014) Guidance on the assessment of dust from demolition and construction
[23] Institute of Air Quality Management and Environmental Protection UK (2017) Land-Use Planning and Development Control: Planning for Air Quality
[24] Institute of Air Quality Management, (2019), A guide to the assessment of air quality impacts on designated nature conservation sites

corridor between Thorpe Astley and Kirby Muxloe and extends along the A47 Hinckley Road. Existing sensitive receptors were selected within these AQMAs as part of the assessment.

9.79. Monitored annual mean NO_2 concentrations indicate a downward trend in concentrations within the AQMAs and across the borough. 2019 monitoring results recorded no exceedances of the annual mean NO_2 objective of 40 $\mu g.m^{-3}$.

9.80. No exceedances of the annual mean PM_{10} objective of 40$\mu g.m^{-3}$ or the annual mean $PM_{2.5}$ objectives of 25$\mu g.m^{-3}$ were recorded over the most recent five years of monitoring data available for review.

Hinckley and Bosworth Borough Council

9.81. No AQMAs were declared by HBBC at the time of assessment. Diffusion tube data indicated there were no exceedances of the annual mean NO_2 objective of 40$\mu g.m^{-3}$ in 2019. Between 2015 and 2018 there was one exceedance recorded at monitoring location 14 which is not within the study area. Overall, annual mean NO_2 concentrations show a downward trend over the past five years. No PM_{10} or $PM_{2.5}$ monitoring is undertaken by HBBC within the borough.

Harborough District Council

9.82. HDC declared two AQMAs for the potential exceedance of the annual mean NO_2 objective, however neither of these are located in the vicinity of the study area. 2019 air quality monitoring indicated exceedances of the annual mean NO_2 objectives at a number of monitoring locations, although these locations are not situated in the vicinity of the study area. Annual mean NO_2 concentrations within the borough fluctuated between 2015 and 2019 with no clear trend evident.

9.83. HDC does not undertake any monitoring of PM_{10} or $PM_{2.5}$ within its borough.

Rugby Borough Council

9.84. RBC declared an AQMA for the potential exceedance of the annual mean NO_2 objective. Rugby AQMA (NO_2) illustrated in Figure 9.3 covers the whole urban area of Rugby, including part of the study area. Exceedances of the annual mean NO2 objective were recorded at locations S54a and 54b. S54b is located within the Rugby AQMA and S54a is located outside of the AQMA in Shilton. These monitoring locations are not within the study area. Overall, annual mean NO_2 concentrations recorded between 2015 and 2019 demonstrate a downward trend.

9.85. RBC does not undertake any monitoring of PM_{10} or $PM_{2.5}$ within its borough.

Background concentrations

9.86. No background monitoring is undertaken in the vicinity of the study area and therefore,

background concentrations were obtained from the latest DEFRA background[25] concentrations maps, which are provided for the UK as a 1km by 1km grid network. The latest maps are based on 2018 monitoring and meteorological data. Predicted background concentrations of NO_2, NOx, PM_{10} and $PM_{2.5}$ were obtained for the grid squares covering the study area for the human and ecological receptors for the years of assessment 2019, 2026 and 2030 (for the 2036 scenario).

9.87. The range of background concentrations for each pollutant and each assessment year are detailed in Table 9.11. Full details of background concentrations used for each grid square are detailed in Appendix 9.7.

9.88. Exceedances of the annual mean air quality objectives are shown in bold.

Table 9.11: DEFRA background concentration ranges

Pollutant	Background Concentrations (µg.m^{-3})			
	2019	2026	2030	Air Quality Objective
NO_2	10.8-24.0	8.4-17.7	7.8-15.9	40
PM_{10}	14.0-17.1	13.0-16.1	13.0-16.1	40
$PM_{2.5}$	8.9-10.9	8.1-10.0	8.0-9.9	25
NO_X*	14.2-**35.7**	10.9-25.1	10.1-22.2	30

*NOx – relevant to the protection of vegetation and ecosystems

9.89. The background concentrations are below the annual mean air quality objectives for NO_2, PM_{10} and $PM_{2.5}$ in all scenarios. The annual mean NOx objective set for the protection of vegetation and ecosystems is predicted to be exceeded in the Base Year 2019 through to 2023.

Baseline local air quality operational phase road traffic emissions assessment

9.90. Pollutant concentrations were predicted at the identified existing sensitive human receptor locations using the dispersion model ADMS-Roads. The range of predicted concentrations for Scenario 1, Scenario 2 and Scenario 4 are detailed in Tables 9.12- 9.14. Full details of pollutant concentrations at sensitive human receptor locations are provided in Appendix 9.10. Exceedances of the annual mean air quality objectives are shown in bold.

[25] Defra (2020) background pollutant concentration maps [https://uk-air.defra.gov.uk/data/laqm-background-maps?year=2019]

Table 9.12: NO_2 baseline pollutant concentrations in Scenario 1: 2019 Base year, Scenario 2: 2026 Opening year without development and Scenario 5: 2036 Future year without development

Local Authority	Scenario 1 2019 Base Year (µg.m^{-3})	Scenario 2 2026 Opening Year Without Development (µg.m^{-3})	Scenario 4 2036 Future Year Without Development (µg.m^{-3})
BDC	10.2-36.4	7.9-23.2	7.3-19.1
HBBC	11.5-**41.1**	8.2-23.6	7.5-18.0
CBC	20.0-31.2	14.2-20.0	12.0-15.7
EBC	23.3-27.2	15.9-17.8	13.7-15.0
HDC	11.7-28.8	8.7-17.1	7.9-13.6
NWBC	13.5-23.0	9.9-10.7	8.8-9.3
NWLC	15.4-36.1	10.5-22.3	9.1-18.2
CCC	24.0-**43.4**	16.2-26.2	13.8-20.9
RBC	14.7-**41.4**	9.1-25.1	10.1-18.9
TBC	15.8-22.1	11.8-16.7	10.6-14.4
NBBC	20.9-34.0	13.4-22.1	10.6-12.6
WNC	20.9-26.8	13.0-15.9	10.6-12.6

Table 9.13: PM_{10} baseline pollutant concentrations in Scenario 1: 2019 Base year, Scenario 2: 2026 Opening year without development and Scenario 5: 2036 Future year without development

Local Authority	Scenario 1 2019 Base Year (µg.m^{-3})	Scenario 2 2026 Opening Year Without Development (µg.m^{-3})	Scenario 4 2036 Future Year Without Development (µg.m^{-3})
BDC	13.6-18.3	12.5-17.1	12.4-17.0
HBBC	13.7-20.4	12.7-17.8	12.7-17.8
CBC	16.9-18.6	15.8-17.5	15.8-17.4
EBC	15.7-16.2	14.6-15.1	14.6-15.1

Local Authority	Scenario 1 2019 Base Year ($\mu g.m^{-3}$)	Scenario 2 2026 Opening Year Without Development ($\mu g.m^{-3}$)	Scenario 4 2036 Future Year Without Development ($\mu g.m^{-3}$)
HDC	13.9-18.3	13.0-17.1	13.1-17.1
NWBC	12.9-16.9	11.9-13.4	11.9-13.3
NWLC	14.6-19.0	13.6-17.8	13.6-17.7
CCC	16.9-19.6	15.8-18.3	15.7-18.4
RBC	14.6-18.9	13.2-17.5	13.2-18.5
TBC	14.9-15.7	13.9-15.2	13.9-15.2
NBBC	15.7-18.3	14.1-16.9	14.1-16.9
WNC	16.4-16.8	15.3-15.6	15.3-15.5

Table 9.14: $PM_{2.5}$ Baseline pollutant concentrations in Scenario 1: 2019 Base year, Scenario 2: 2026 Opening year without development and Scenario 5: 2036 Future year without development

Local Authority	Scenario 1 2019 Base Year ($\mu g.m^{-3}$)	Scenario 2 2026 Opening Year Without Development ($\mu g.m^{-3}$)	Scenario 4 2036 Future Year Without Development ($\mu g.m^{-3}$)
BDC	8.7-11.5	7.9-10.5	7.8-10.4
HBBC	8.6-12.7	7.8-10.6	7.8-10.5
CBC	10.4-11.1	9.6-10.2	9.6-10.2
EBC	10.0-10.4	9.2-9.5	9.2-9.5
HDC	8.8-11.1	8.1-10.1	8.1-10.0
NWBC	8.5-10.2	7.7-8.2	7.7-8.2
NWLC	9.2-11.1	8.3-10.1	8.3-10.0
CCC	11.0-12.8	10.1-11.7	10.1-11.8
RBC	9.3-11.5	8.2-10.5	8.2-11.0

Local Authority	Scenario 1 2019 Base Year ($\mu g.m^{-3}$)	Scenario 2 2026 Opening Year Without Development ($\mu g.m^{-3}$)	Scenario 4 2036 Future Year Without Development ($\mu g.m^{-3}$)
TBC	9.7-10.2	8.9-9.6	8.9-9.5
NBBC	10.0-11.8	8.9-10.7	8.8-10.7
WNC	10.3-10.6	9.3-9.5	9.3-9.5

9.91. There are three exceedances of the annual mean air quality objective for NO_2 in the 2019 Base Year at human receptors in the study area. These exceedances are located adjacent to the M1 motorway in HBBC, M6 motorway in CCC and M69 motorway in RBC which carry large volumes of traffic and therefore exceedances are anticipated. The exceedance in CCC is within the city wide AQMA. However, the maximum annual mean predicted baseline concentrations are expected to decrease across the study area in the 2026 Opening Year and 2036 Future Year Without Development scenarios. No exceedances of the annual mean NO_2 objective are predicted in the Opening Year or Future Year baseline scenarios.

9.92. There are no exceedances of the annual mean air quality objectives for PM_{10} and $PM_{2.5}$ at any of the human receptor locations considered in the assessment.

9.93. Predicted concentrations at short term human receptors were compared to the short term air quality objectives for NO_2 and PM_{10}. The predicted annual mean NO_2 concentrations are less than 60µg.m^{-3} and therefore in accordance with DEFRA guidance it may be assumed that exceedance of the 1-hour mean objective is unlikely. The calculation detailed in paragraph 9.40 was used to determine potential exceedance of the 24-hour PM_{10} short term objective; no exceedances were predicted.

POTENTIAL SIGNIFICANT ENVIRONMENTAL EFFECTS OF THE PROPOSALS

Construction phase dust assessment

9.94. The construction phase of the Proposed Development will involve a number of activities which have the potential to impact on local air quality. These include emissions of dust generated through demolition, excavation, construction and trackout activities, exhaust pollutant emissions from construction traffic on the local highway network, and exhaust emissions from non-road mobile machinery (NRMM) within the construction site itself.

9.95. The location of sensitive receptors in relation to construction activities will affect the potential for such construction activities to cause dust soiling, nuisance and local air quality impacts. Meteorological conditions and the use of control measures will also contribute to the effects experienced.

9.96. Steps 1 to 4 of the IAQM guidance[22] were followed in undertaking the construction phase dust assessment. Full details of the assessment undertaken are provided in Appendix 9.3 with a summary of the findings of Steps 2a, 2b and 2c of the assessment provided below.

9.97. To enable a conservative assessment, the construction phase dust assessment was undertaken utilising the boundaries of the Order Limits where construction activities were proposed. Where off-site improvement works do not involve construction activities, e.g. replacement of signage, these works were not considered in the construction phase dust assessment.

Step 2: Assess the risk of dust impacts

Step 2A: Define the potential dust emission magnitude

9.98. The dust emission magnitudes for the construction activities were defined using the criteria detailed in the IAQM guidance[22] and detailed in Appendix 9.3. The dust emission magnitudes for the construction phase of the Proposed Development are summarised in Table 9.15.

Table 9.15: Dust emissions magnitudes definition

Activity	Project Defined Dust Emission Magnitude	Justification
Demolition	Large	Total building volume significantly greater than 50,000m^3 with potentially dusty construction materials to be used.
Earthworks	Large	Total site area is significantly greater than 10,000m^2.
Construction	Large	Total building volume significantly greater than 100,000m^3
Trackout	Large	>50 HDV movements in any one day over the duration of the development

Step 2B: Define the sensitivity of the area

9.99. The sensitivity of the study area takes into account specific receptors in the vicinity of the DCO Site, the proximity and number of those receptors, the local background concentration of PM_{10} and Site-specific factors. The assessment requires the determination of the sensitivity of the area for the purposes of dust soiling, human health and ecological impacts and these are presented in Table 9.16**.**

Table 9.16: Determination of the sensitivity of the study area

Activity	Project Defined Dust Emission Magnitude	Justification			
		Demolition	Earthworks	Construction	Trackout
Dust Soiling	There are more than 100 highly sensitive receptors within 20m of the DCO Site. The sensitive receptors identified are residential dwellings, car parks and footpaths within 20m of the Proposed	High	High	High	High

Activity	Project Defined Dust Emission Magnitude	Justification			
		Demolition	Earthworks	Construction	Trackout
	Development where dust soiling may affect the amenity of the users there for extended periods. Residential dwellings and long term car parks would be considered highly sensitive in accordance with guidance. Footpaths would be considered low sensitivity receptors.				
Human Health	There are more than 100 highly sensitive receptors within 20m of the DCO Site. The highly sensitive receptors are residential dwellings. The background PM_{10} concentrations detailed within Table 9.10 are less than 24µg.m^{-3}	Medium	Medium	Medium	Medium
Ecological Receptors	The Burbage Common and Woods and Aston Firs SSSI are located within 20m of the DCO Site. The appointed ecological consultants advised the habitats have a medium sensitivity to dust. Due to the close proximity of these sites to the Proposed Development and to provide a conservative assessment, the sensitivity of the sites to dust was uplifted to high.	High	High	High	High

Step 2C: Define the risk of impacts

9.100. The dust emission magnitude in Step 2A is then combined with the sensitivity of the area determined in Step 2B to define the risk of dust impacts with no mitigation applied. The results of this assessment are detailed in Table 9.17.

Table 9.17: Summary of dust risk table to define site specific risk

Activity	Step 2A: Dust Emission Magnitude	Step 2B: Sensitivity of the Area	Step 2C: Risk of Dust Impacts
Dust Soiling Effects on People and Property			
Demolition	Large	High	High Risk
Earthworks	Large	High	High Risk
Construction	Large	High	High Risk
Trackout	Large	High	High Risk
Human Health Impacts			
Demolition	Large	Medium	High Risk
Earthworks	Large	Medium	Medium Risk
Construction	Large	Medium	Medium Risk
Trackout	Large	Medium	Medium Risk
Ecological Receptors			
Demolition	Large	High	High Risk
Earthworks	Large	High	High Risk
Construction	Large	High	High Risk
Trackout	Large	High	High Risk

Operational phase road traffic emissions assessment- human receptors

9.101. Concentrations of NO_2, PM_{10} and $PM_{2.5}$ were predicted at identified existing receptor locations across the study area for Scenario 2 to Scenario 5 to consider the impact of development-generated vehicles on local air quality with the Proposed Development in place.

2026 Opening year and 2036 Future year

9.102. The ranges of predicted NO_2, PM_{10} and $PM_{2.5}$ concentrations are detailed in Tables 9.18 – 9.20 for Scenario 2 to Scenario 5. The predicted NO_2, PM_{10} and $PM_{2.5}$ concentrations are illustrated in Figures 9.12 – 9.14 for 2026 and Figures 9.18 – 9.20 for 2036. The operational effects reported are local, long-term and permanent. Full details of pollutant concentrations at sensitive receptor locations are detailed in Appendix 9.10.

Table 9.18: Predicted annual mean NO_2 concentration ranges and Proposed Development impact at existing human receptor locations in Scenario 2:2026 Opening year without development, Scenario 3:2026 Opening year with development, Scenario 4:2036 Future year without development and Scenario 5:2036 Future year with development

Local Authority	Scenario 2: 2026 Without Development (NO_2 µg.m^{-3})	Scenario 3: 2026 With Development (NO_2 µg.m^{-3})	Change (µg.m^{-3})	Effect	Scenario 4: 2036 Without Development (NO_2 µg.m^{-3})	Scenario 5: 2036 With Development (NO_2 µg.m^{-3})	Change (µg.m^{-3})	Effect
BDC	8.2-23.2	8.2-23.2	-0.2-+0.3	Negligible	7.5-19.1	7.5-19.0	-0.1-+0.3	Negligible
HBBC	8.2-23.6	8.2-23.5	-0.7-+1.6	Negligible	7.5-18.0	7.4-17.9	-0.5-+1.7	Negligible
CBC	14.2-20.0	14.2-20.0	-0.2-0.0	Negligible	12.0-15.7	12.0-15.7	0.0-+0.2	Negligible
EBC	15.9-17.8	15.8-17.6	-0.2- -0.1	Negligible	13.7-15.0	13.7-15.0	0.0	Negligible
HDC	8.7-17.1	8.5-17.2	-0.4-+0.3	Negligible	7.9-13.6	8.0-13.6	-0.3-+0.1	Negligible
NWBC	9.9-10.7	9.9-10.7	-0.1-0.0	Negligible	8.8-9.3	8.8-9.3	0.0	Negligible
NWLC	10.5-22.3	10.5-22.0	-0.3-+0.8	Negligible	9.1-18.2	9.1-18.2	0.0-+0.1	Negligible
CCC	16.2-26.2	16.3-26.4	-0.1-+0.2	Negligible	13.8-20.9	13.9-21.1	0.0-+0.2	Negligible
RBC	9.1-25.1	9.1-25.9	-0.6-+0.8	Negligible	10.1-18.9	10.3-20.0	-0.4-+1.1	Negligible
TBC	11.8-16.7	11.8-16.6	-0.1-0.0	Negligible	10.6-14.4	10.6-14.3	-0.1-0.0	Negligible
NBBC	13.4-22.1	13.3-21.8	-0.3-+0.2	Negligible	12.1-19.0	12.1-19.0	0.0	Negligible
WNC	13.0-15.9	13.0-15.9	0.0	Negligible	10.6-12.6	10.6-12.6	0.0	Negligible
Air Quality Objective 40µg.m^{-3}								

**Discrepancies due to rounding*

Table 9.19: Predicted annual mean PM_{10} concentration ranges and Proposed Development impact at existing human receptor locations in Scenario 2: 2026 Opening year without development, and Scenario 3: 2026 Opening year with development, Scenario 4:2036 Future year without development and Scenario 5:2036 Future year with development

Local Authority	Scenario 2: 2026 Without Development (PM_{10} µg.m^{-3})	Scenario 3: 2026 With Development (PM_{10} µg.m^{-3})	Change (µg.m$^{-3)}$	Effect	Scenario 4: 2036 Without Development (PM_{10} µg.m^{-3})	Scenario 5: 2036 With Development (PM_{10} µg.m^{-3})	Change (µg.m$^{-3)}$	Effect
BDC	12.5-17.1	12.5-17.1	-0.1-+0.3	Negligible	12.4-17.0	12.4-17.0	-0.1-+0.2	Negligible
HBBC	12.7-17.8	12.7-17.9	-0.3-+1.8	Negligible	12.7-17.8	12.6-17.8	-0.3-+0.2	Negligible
CBC	15.8-17.5	15.8-17.5	-0.1-0.0	Negligible	15.8-17.4	15.8-17.5	0.0-+0.2	Negligible
EBC	14.6-15.1	14.6-15.1	0.0	Negligible	14.6-15.1	14.6-15.1	0.0	Negligible
HDC	13.0-17.1	12.9-17.1	-0.1-+0.3	Negligible	13.1-17.1	12.9-17.1	-0.2-+0.2	Negligible
NWBC	11.9-13.4	11.9-13.4	0.0	Negligible	11.9-13.3	11.9-13.4	0.0	Negligible
NWLC	13.6-17.8	13.6-17.7	-0.1-+0.3	Negligible	13.6-17.7	13.6-17.8	-0.1-+0.2	Negligible
CCC	15.8-18.3	15.8-18.3	0.0-+0.1	Negligible	15.7-18.4	15.8-18.5	-0.2-+0.1	Negligible
RBC	13.2-17.5	13.3-17.6	-0.2-+0.3	Negligible	13.2-18.5	13.3-16.5	-0.7-+0.2	Negligible
TBC	13.9-15.2	13.9-15.2	0.0	Negligible	13.9-15.2	13.9-15.2	0.0-+0.3	Negligible
NBBC	14.1-16.9	14.1-16.7	-0.1-0.0	Negligible	14.1-16.9	14.2-16.9	0.0	Negligible
WNC	15.3-15.6	15.4-15.6	0.0	Negligible	15.3-15.5	15.3-15.5	0.0	Negligible
Air Quality Objective 40µg.m^{-3}								

**Discrepancies due to rounding*

Table 9.20: Predicted annual mean $PM_{2.5}$ concentration ranges and Proposed Development impact at existing human receptor locations in Scenario 2: 2026 Opening year without development, and Scenario 3: 2026 Opening year with development, Scenario 4:2036 Future year without development and Scenario 5:2036 Future year with development

Local Authority	Scenario 2: 2026 Without Development ($PM_{2.5}$ µg.m^{-3}	Scenario 3: 2026 With Development ($PM_{2.5}$ µg.m^{-3}	Change (µg.m^{-3})	Effect	Scenario 4: 2036 Without Development ($PM_{2.5}$ µg.m^{-3}	Scenario 5: 2036 With Development ($PM_{2.5}$ µg.m^{-3}	Change (µg.m^{-3})	Effect
BDC	7.9-10.5	7.8-10.5	-0.2-+0.3	Negligible	7.8-10.4	7.8-10.4	-0.1-+0.2	Negligible
HBBC	7.8-10.6	7.8-10.6	-0.1-+0.9	Negligible	7.8-10.5	7.8-10.5	-0.3-+0.2	Negligible
CBC	9.6-10.2	9.6-10.2	0.0	Negligible	9.6-10.2	9.6-10.2	0.0-+0.1	Negligible
EBC	9.2-9.5	9.2-9.5	0.0	Negligible	9.2-9.5	9.2-9.5	0.0	Negligible
HDC	8.1-10.1	8.0-10.1	-0.1-+0.1	Negligible	8.1-10.0	8.10-10.0	-0.1-+0.1	Negligible
NWBC	7.7-8.2	7.7-8.2	0.0	Negligible	7.7-8.2	7.7-8.2	0.0	Negligible
NWLC	8.3-10.1	8.3-10.0	0.0-+0.2	Negligible	8.3-10.0	8.3-10.1	0.0-+0.1	Negligible
CCC	10.1-11.7	10.2-11.7	0.0	Negligible	10.1-11.8	10.1-11.8	-0.1-0.0	Negligible
RBC	13.2-17.5	13.3-17.6	-0.1-+0.2	Negligible	8.2-11.0	8.2-10.7	-0.3-+0.1	Negligible
TBC	8.9-9.6	8.9-9.6	0.0	Negligible	8.9-9.5	8.9-9.6	0.0-+0.1	Negligible
NBBC	8.9-10.7	8.9-10.6	-0.1-0.0	Negligible	8.8-10.7	8.8-10.7	0.0	Negligible
WNC	9.3-9.5	9.3-9.5	0.0	Negligible	9.3-9.5	9.3-9.5	0.0	Negligible
Air Quality Objective 25µg.m^{-3}								

**Discrepancies due to rounding*

9.103. The predicted concentrations of NO_2, PM_{10} and $PM_{2.5}$ in Scenarios 2 to Scenario 5 are below the annual mean air quality objectives at all receptors considered in the assessment. The Proposed Development is not predicted to lead to any exceedances of the relevant air quality objectives.

9.104. Predicted changes in concentrations at all receptors in both the '2026 Opening Year' and '2036 Future Year' With and Without Development scenarios are 4% or less of the relevant air quality objective and the total pollutant concentrations is less than 75% of the relevant air quality objective.

9.105. With regard to short term air quality objectives, the predicted annual mean NO_2 concentrations are less than $60\mu g.m^{-3}$ and therefore in accordance with DEFRA guidance[20] it may be assumed that exceedances of the 1-hour mean objective are unlikely.

9.106. With regard to short term air quality objectives for PM_{10} at the existing receptor locations, the calculation detailed in paragraph 9.40 was used to determine potential exceedance of the 24-hour PM_{10} short term objective; no exceedances were predicted.

9.107. The effect of the Proposed Development is therefore considered to be 'negligible' in accordance with IAQM and EPUK guidance[23] which is 'not significant'.

9.108. Consideration was given to the predicted magnitude of change at receptor locations in accordance with DMRB LA105[21]. As no receptor locations with the Proposed Development in the 2026 Opening Year or 2036 Future Year scenarios are predicted to be within 10% of the relevant air quality objective for an assessed pollutant, the significance criteria within DMRB LA105[21] does not apply. Further details can be found in Appendix 9.11.

9.109. Tables 9.21 and 9.22 and figures 9.15 – 9.17 and 9.21 – 9.23 provides a summary across the study area of the total number of considered receptors which are predicted to have an improvement, deterioration or no change as a result of the Proposed Development in the 2026 Opening Year and 2036 Future Year Without and With Development scenarios respectively.

Table 9.21: Summary of total number of considered receptors with an improvement, no change or deterioration in pollutant concentrations in 2026 Opening year with the Proposed Development

Local Authority Area	Total Number of Considered Receptors								
	Improvement in Concentrations (+ve) (2026)			No Change in Concentrations (2026)			Deterioration in Concentrations (-ve) (2026)		
	NO_2	PM_{10}	$PM_{2.5}$	NO_2	PM_{10}	$PM_{2.5}$	NO_2	PM_{10}	$PM_{2.5}$
BDC	26	20	20	0	0	0	29	35	34
HBBC	72	54	56	2	0	0	33	53	51
CBC	2	1	1	0	0	0	1	2	2
EBC	3	3	3	0	0	0	0	0	0
HDC	8	7	7	0	0	0	6	7	7
NWBC	4	3	4	1	0	0	2	4	3
NWLC	3	2	2	3	0	0	5	9	9
CCC	2	1	1	0	0	0	3	4	4
RBC	3	3	3	0	0	0	9	9	9
TBC	6	1	1	0	0	0	0	5	5
NBBC	4	4	4	0	0	0	1	1	1
WNC	0	0	0	0	0	0	3	3	3
TOTALS	**133**	**99**	**102**	**6**	**0**	**0**	**92**	**132**	**128**

Table 9.22: Summary of total number of considered receptors with an improvement, no change or deterioration in pollutant concentrations in 2036 Future year with the Proposed Development

Local Authority Area	Total Number of Considered Receptors								
	Improvement in Concentrations (+ve) (2036)			No Change in Concentrations (2036)			Deterioration in Concentrations (-ve) (2036)		
	NO_2	PM_{10}	$PM_{2.5}$	NO_2	PM_{10}	$PM_{2.5}$	NO_2	PM_{10}	$PM_{2.5}$
BDC	23	20	20	4	0	0	28	35	35

Local Authority Area	Total Number of Considered Receptors								
	Improvement in Concentrations (+ve) (2036)			No Change in Concentrations (2036)			Deterioration in Concentrations (-ve) (2036)		
	NO_2	PM_{10}	$PM_{2.5}$	NO_2	PM_{10}	$PM_{2.5}$	NO_2	PM_{10}	$PM_{2.5}$
HBBC	70	75	75	4	0	0	33	32	32
CBC	2	0	0	0	0	0	1	3	3
EBC	0	0	0	3	0	0	0	3	3
HDC	7	7	7	1	0	0	6	7	7
NWBC	4	1	1	1	0	0	2	6	6
NWLC	6	1	1	0	0	0	6	11	11
CCC	0	2	2	0	0	0	5	3	3
RBC	4	6	6	0	0	0	6	4	4
TBC	5	1	1	0	0	0	0	4	4
NBBC	0	1	1	0	0	0	5	4	4
WNC	0	0	0	1	0	0	2	3	3
TOTALS	**121**	**114**	**114**	**14**	**0**	**0**	**94**	**115**	**115**

9.110. In the 2026 Opening Year With Development scenario, there are predicted to be 133 improvements in NO_2 concentrations and 99 and 102 improvements in PM_{10} and $PM_{2.5}$ concentrations respectively at considered existing receptor locations across the study area as a result of the operation of the Proposed Development. Conversely, there are predicted to be 92 deteriorations of NO_2 concentrations and 133 and 128 deteriorations in PM_{10} and $PM_{2.5}$ concentrations respectively.

9.111. In the 2036 Future Year With Development scenario, there are predicted to be 121 improvements in NO_2 concentrations and 114 improvements in PM_{10} and $PM_{2.5}$ concentrations at considered existing receptor locations within the study area as a result of the operation of the Proposed Development. Conversely, there are predicted to be 94 deteriorations of NO_2 concentrations and 115 deteriorations of PM_{10} and $PM_{2.5}$ concentrations.

9.112. The improvements in pollutant concentrations at some identified existing receptors in the 2026 Opening Year and 2036 Future Year scenarios are due to a redistribution of traffic across the network.

9.113. The overall effect of the Proposed Development on air quality is considered to be 'negligible' and 'not significant':

- Consideration was given to national and planning policy and the Proposed Development is considered to be in accordance with these polices with regard to air quality.
- Existing concentrations of NO_2, PM_{10} and $PM_{2.5}$ in the study area are predicted to be below the relevant air quality objectives at all receptors and the impact of the development on existing sensitive receptors is negligible in accordance with the IAQM and EPUK guidance and the Proposed Development does not lead to any new exceedances of the air quality objective.
- The AQA undertaken utilised robust model inputs including appropriate meteorological data and surface roughness and cumulative traffic flows.
- The impact of development-generated road traffic on local air quality is defined as negligible at all receptors in the assessment in accordance with IAQM and EPUK guidance.

9.114. The sensitivity of all of the assessed receptors is considered to be high. The magnitude of change and absolute concentrations were considered simultaneously with regard to Table 9.10 and IAQM and EPUK guidance[23]. Taking into consideration the results of the assessment, there is likely to be a local, permanent, negligible effect at all receptors.

Operational phase road traffic emissions assessment-ecological receptors

Critical level

9.115. Concentrations of NOx were predicted along transects through each of the designated

sites. Predicted concentrations were compared to the critical level of 30µg.m^{-3} for the protection of vegetation and ecosystems. The range of concentrations predicted are detailed in Table 9.23 for Scenario 2 to 5. Further details of the results are available in Appendix 9.12.

Table 9.23: Predicted NOx concentration ranges at the designated ecological sites within the study area in Scenario 2: 2026 Opening year without development, Scenario 3: 2026 Opening year with development, Scenario 4: 2036 Future year without development and Scenario 5: 2036 Future year with development

Receptor	Scenario 2: 2026 Opening Year Without Development (NOx µg.m^{-3})	Scenario 3: 2026 Opening Year With Development (NOx µg.m^{-3})	Change (µg.m^{-3})	Scenario 4: 2036 Future Year Without Development (NOx µg.m^{-3})	Scenario 5: 2036 Future Year With Development (NOx µg.m^{-3})	Change (µg.m^{-3})
Burbage LNR	11.6-12.0	11.7-12.2	-0.1- -0.4	10.6-10.9	10.6-11.2	-0.1-+0.3
Freeholt Wood AW	14.6-14.7	14.9-15.0	+0.2-+04	12.7	12.9-13.0	+0.2-+0.3
Aston Firs SSSI	12.6-14.9	12.7-14.7	-0.3-+0.1	11.3-12.7	11.3-12.7	0.0-+0.1
Narborough Bogs SSSI	19.3-20.4	19.3-20.4	0.0	16.3-17.1	16.3-17.1	0.0
Wyken Slough LNR	24.4-25.2	24.0-24.7	-0.5- -0.4	20.4-21.0	20.5-21.1	+0.1
Cave's Inn Pitts SSSI	15.3-15.8	15.4-15.8	0.0	13.0-13.3	13.0-13.4	+0.1
Shawell Wood AW	18.1-**41.7**	18.2-**41.9**	0.0 -+0.2	14.7-**31.4**	14.7-**31.5**	0.0-+0.1
Martinshaw Wood AW	18.5-**82.8**	18.5-**82.2**	-0.6 -0.0	15.3-**57.6**	15.2-**57.0**	-0.6 -0.0
Oakley Wood SSSI	20.7 - 28.4	20.6 - 28.4	0.0	16.7 - 21.8	16.7 - 21.8	0.0 - +0.1
Piper Wood AW	15.7 - **30.7**	15.7 - **30.6**	0.0	13.3 - 23.5	13.3 - 23.4	0.0 - +0.1
Tonge Gorse AW	14.1 - 29.0	14.1 - 29.1	0.0 - +0.1	12.2 - 22.4	12.2 - 22.4	0.0 - +0.1
Lount Meadows SSSI	13.4 - 23.0	13.4 - 23.0	0.0 - +0.1	11.5 - 18.1	11.6 - 18.2	0.0 - +0.1
River Mease SAC	12.3 - 27.4	12.3 - 27.2	-0.1 - 0.0	10.6 - 20.7	10.6 - 20.8	0.0 - +0.1
Bramcote Covert AW	14.9 - 16.3	14.8 - 16.3	0.0	12.5 - 13.5	12.6 - 13.6	+0.1
Alvecote Pools SSSI	15.5-17.9	15.5 - 17.9	0.0	13.2 - 14.8	13.2 - 14.8	0.0
Grendon Wood AW	11.3 - 11.7	11.3 - 11.7	0.0	10.2 - 10.4	10.2 - 10.4	0.0
Sparrowdale Wood AW	11.7 - 11.8	11.7 - 11.8	0.0	10.7	10.7	0.0
Daniels Wood AW	21.3 - 29.9	21.3 - 29.9	0 - +0.1	17.4 - 23.3	17.5 - 23.7	+0.1 - +0.4
Many Lands Woods AW	16.9 - 18.0	17.2 - 18.4	+0.3 - +0.4	14.5 - 15.4	14.6 - 15.4	0.0
Ashlawn Cutting LNR	17.4 - 27.8	17.4 - 27.9	0.0 - +0.2	14.2 - 21.2	14.2 - 21.2	0.0

Receptor	Scenario 2: 2026 Opening Year Without Development (NOx µg.m^{-3})	Scenario 3: 2026 Opening Year With Development (NOx µg.m^{-3})	Change (µg.m^{-3})	Scenario 4: 2036 Future Year Without Development (NOx µg.m^{-3})	Scenario 5: 2036 Future Year With Development (NOx µg.m^{-3})	Change (µg.m^{-3})
Kettle Brook LNR	15.7-**40.8**	15.7-**40.8**	-0.4 - 0.0	13.9 - **31.1**	13.8 - **30.9**	-0.7 - 0.0

9.116. Concentrations of NOx at the ecological transects were predicted to be below the critical level of 30µg.m^{-3} in all scenarios considered, with the following exceptions:

- Shawell Wood AW - exceedances of the NOx critical level were predicted adjacent to the M1 at the transect points closest to the road (26-46m) in the 2026 Opening Year and Without and With Development scenarios and at 26m in the Future Year With and Without Development scenarios;

- Martinshaw Wood AW - exceedances of the NOx critical level were predicted adjacent to the M1 at the transect points closest to the road (5-135m) in the 2026 Opening Year Without and With Development scenarios and at 5-65m in the 2036 Future Year With and Without Development scenarios;

- Piper Wood AW - exceedances of the NOx critical level were predicted adjacent to the M1 at the transect point closest to the road (29m) in the 2026 Opening Year Without and With Development scenarios. There are no exceedances in the Without and With Development Future Year scenarios; and

- Kettlebrook LNR - exceedances of the NOx critical level were predicted on the boundary of the Kettlebrook LNR in transect 1 and within the Kettlebrook LNR up to 10m into the designation on transect 6, in the 2026 Opening Year Without and With Development scenarios. Additionally, exceedances of the critical level were predicted on the boundary of the designation on transect 6 in the 2036 Completion year Without and With Development scenarios.

9.117. The results were provided to the appointed ecological consultants for analysis and are discussed in Chapter 12: *Ecology and Biodiversity*.

Critical load

9.118. Transects were modelled at 10m intervals, up to 200m into each of the designated sites, to consider the impact of nitrogen deposition (N) on each of the ecological sites. The percentage change in deposition was compared to the lower critical load for each habitat. The range of concentrations predicted at each site are detailed in Tables 9.24 and 9.25 for 2026 Opening Year Without and With Development Scenarios and 2036 Future Year Without and With Development Scenarios. The full results are presented in Appendix 9.12.

Table 9.24: Predicted nitrogen deposition ranges at the designated ecological sites in 2026 Opening year scenarios

Receptor	Critical Load (kg N $ha^{-1}yr^{-1}$)	2026 Opening Year Without Development N Deposition (kg N $ha^{-1}yr^{-1}$)	2026 Opening Year With Development N Deposition (kg N $ha^{-1}yr^{-1}$)	Change in Nitrogen Deposition (kg N $ha^{-1}yr^{-1}$)	Percentage Change of Lower Critical Load (kg N $ha^{-1}yr^{-1}$)
Burbage Wood LNR	10-15	**27.2 - 27.4**	**27.2 - 27.4**	-0.1 – 0.0	-0.6 - +0.2
Freeholt Wood AW	10-20	**50.7**	**50.7**	0.0	-0.3 - 0.0
Aston Firs SSSI	15-20	**49.6 - 50.0**	**49.6 - 50.0**	-0.3 - 0.0	-1.8 - -0.3
Narborough Bogs SSSI	10-20	**53.5 - 53.6**	**53.3 - 53.4**	-0.2	-2.1 - -1.6
Wyken Slough LNR	10-15	**25.4 - 25.5**	**25.4**	0.0	-0.4 - -0.3
Cave's Inn Pits SSSI	20-30	**27.3 - 27.4**	**27.3 - 27.4**	0.0	0.0
Shawell Wood AW	10-20	**49.0 - 52.0**	**49.0 - 52.0**	0.0	+0.1 - +0.3
Martinshaw Wood AW	5-15	**44.9 - 53.5**	**44.9 - 53.5**	0.0	-1.2 - 0.0
Oakley Wood SSSI	15-20	**44.3 - 45.5**	**44.3 - 45.5**	0.0	0.0
Piper Wood AW	10-20	**43.5 - 45.7**	**43.5 - 45.7**	0.0	-0.1 - 0.0
Tonge Gorse AW	10-20	**43.5 - 45.7**	**43.5 - 45.7**	0.0	0.0 - +0.2
Lount Meadows SSSI	20-30	**30.8 - 32.2**	**30.8 - 32.2**	0.0	0.0 - +0.1
River Mease SAC*	No data available	12.8 -13.9	12.8 -13.9	0.0	No critical load
Bramcote Covert AW	10-20	**41.8 - 42.0**	**41.8 - 42.0**	0.0	-0.1 - 0.0
Alvecote Pools SSSI	20-30	12.0 - 12.1	12.0 - 12.1	0.0	0.0
Grendon Wood AW	10-20	**39.4 – 39.4**	**39.4 - 39.5**	0.0	0.0
Sparrowdale Wood AW	10-20	**37.6 – 37.6**	**37.6 – 37.6**	0.0	0.0
Daniels Wood AW	10-20	**43.4 - 44.7**	**43.4 - 44.7**	0.0	+0.1
Many Lands Woods AW	10-20	**43.6 - 43.7**	**43.6 - 43.8**	0.0 - +0.1	+0.5 - +0.7
Ashlawn Cutting LNR	10-20	**44.3 - 45.8**	**44.3 - 45.8**	0.0	0.0 - +0.2
Kettle Brook LNR	10-20	**38.2 - 39.9**	**38.2 - 39.8**	0.0	-0.3 - 0.0

**Project Ecologist confirmed that River Mease SAC is not sensitive to nitrogen deposition.*

Table 9.25: Predicted nitrogen deposition ranges at the designated ecological sites in 2036 Future year scenarios

Receptor	Critical Load (kg N $ha^{-1}yr^{-1}$)	2026 Opening Year Without Development N Deposition (kg N $ha^{-1}yr^{-1}$)	2026 Opening Year With Development N Deposition (kg N $ha^{-1}yr^{-1}$)	Change in Nitrogen Deposition (kg N $ha^{-1}yr^{-1}$)	Percentage Change of Lower Critical Load (kg N $ha^{-1}yr^{-1}$)
Burbage Wood LNR	10-15	**25.7 - 25.8**	**25.7 - 25.8**	0.0 - +0.1	+0.1 - +0.6
Freeholt Wood AW	10-20	**49.1 – 49.1**	**49.1 - 49.2**	0.0 - +0.1	+0.3 - +0.5
Aston Firs SSSI	15-20	**48.2 - 48.4**	**48.2 - 48.4**	0.0	0.0 - +0.1
Narborough Bogs SSSI	10-20	**51.9 - 52.0**	**51.9 - 52.1**	0.0	0.0
Wyken Slough LNR	10-15	**25.0**	**25.0**	0.0	0.0 - +0.1
Cave's Inn Pits SSSI	20-30	**25.4**	**25.4**	0.0	0.0 -+0.1
Shawell Wood	10-20	**46.7 - 49.3**	**46.7 - 49.3**	0.0	0.0 - +0.1
Martinshaw Wood AW	5-15	**43.1 - 49.0**	**43.1 - 49.0**	0.0	-1.5 - -0.1
Oakley Wood SSSI	15-20	**42.2 - 43.0**	**42.2 - 43.0**	0.0	0.0
Piper Wood AW	10-20	**41.6 - 43.3**	**41.6 - 43.3**	0.0	-0.1 - 0.0
Tonge Gorse AW	10-20	**41.4 - 43.0**	**41.4 - 43.0**	0.0	0.0 - +0.1
Lount Meadows SSSI	20-30	**28.9 - 29.9**	**28.9 - 29.9**	0.0	0.0
River Mease SAC	No data available	11.8 - 12.6	11.8 - 12.6	0.0	No critical load
Bramcote Covert AW	10-20	**39.9 - 40.1**	**40.0 - 40.1**	0.0	+0.1 - +0.2
Alvecote Pools SSSI	20-30	11.1 - 11.2	11.1 - 11.2	0.0	0.0
Grendon Wood AW	10-20	**38.1**	**38.1**	0.0	0.0
Sparrowdale Wood AW	10-20	**37.0**	**37.0**	0.0	0.0
Daniels Wood AW	10-20	**42.3 - 43.2**	**42.3 - 43.2**	0.0 -+0.1	+0.2 - +0.7
Many Lands Woods LNR	10-20	**42.1 - 42.2**	**42.1 - 42.2**	0.0	0.0 - +0.1
Ashlawn Cutting LNR	10-20	**42.3 - 43.4**	**42.3 - 43.4**	0.0	0.0
Kettle Brook LNR	10-20	**37.7 - 39.0**	**37.7 - 39.0**	-0.1 - 0.0	-0.5 - 0.0

9.119. All modelled transect points experiencing a change in nitrogen deposition of less than 1% of the lower critical load as detailed in Tables 9.24 and 9.25 are predicted to experience a 'not significant' impact in accordance with DMRB guidance[21].

9.120. Within Martinshaw Wood AW, Ashton Firs SSSI and Narborough Bog SSSI, there is predicted to be change in nitrogen deposition concentrations greater than 1% of the lower relevant critical load along some of the transect points. The results were therefore referred to the appointed ecological consultants, to determine any potential impact. Further details are available in Chapter 12: *Ecology and Biodiversity*.

Rail emissions

9.121. The operational development would lead to an increase in the number of trains using the Felixstowe to Nuneaton freight line to access the Proposed Development.

9.122. DEFRA guidance[20] sets out a list of railway lines which are currently considered to experience heavy traffic of diesel locomotives. The Felixstowe to Nuneaton line is not one of these lines.

9.123. It is recognised that Covid 19 is likely to have affected movements on the line. In the absence of information on known movements post March 2020, Realtimetrains[26] was used to provide the baseline for the existing movements at the current time on a weekday.

9.124. Typical existing train movements were considered for the baseline and these are detailed below in Table 9.26**.**

Table 9.26: Existing train movements

Train Type	No. daytime movements based on known movements (two-way)	No. of night-time movements based on known movements (two-way)
Turbostar Class 170	64	5
Class 66 freight engines	41	21

9.125. It is understood that there will be a maximum of 16 intermodal train movements per day as a result of the Proposed Development, which will result in an additional 32-two way movements. Unloading times at the HNRFI will be a 24 hour operation and a DCO requirement could be provided to ensure that engines are to be switched off within 30 minutes of a shunt or a move.

9.126. DEFRA guidance[20] provides a screening criterion for both stationary and moving diesel locomotives, above which more detailed assessment may be required. Table 9.27

[26] *https://www.realtimetrains.co.uk/*

compares the DEFRA screening criteria to the Proposed Development.

Table 9.27: Rail screening of the Proposed Development

DEFRA Criteria	DEFRA Screening Criteria	Proposed Development	Criteria Exceeded
Stationary locomotives	Locations where diesel locomotives are regularly (at least 3 times a day stationary for more than 15 minutes or more); and	16 trains per day. Planning condition could be provided to ensure that engines will be switched off within 30 minutes of a shunt/move.	No
	Presence of relevant exposure within 15m of the locomotives	It is not anticipated that there will be any sensitive receptors within 15m of locomotives being loaded. Please see Figure 9.24 for an illustration.	
Moving locomotives	Background annual mean NO_2 concentration about 25µg.m^{-3}	Background concentrations are well below this threshold as indicated in Table 9.11.	No
	Relevant exposure within 30m of the relevant railway tracks	Railway line is not a 'Rail Line with Heavy Traffic' as defined by DEFRA	No

9.127. It was determined that the Proposed Development would not exceed any of the screening criteria detailed in Table 9.27 for rail locomotives. Furthermore, it is anticipated that the Proposed Development would only generate an additional 16 train movements (32 two way movements) per day, less than 1 per hour over a 24-hour period.

9.128. Based on the number of trains already on the rail network, the additional train movements generated by the Proposed Development will be so small as to be considered not significant. Therefore the impacts on local air quality from rail emissions as a result of the operational development are deemed to be negligible and 'not significant'.

PROPOSED MITIGATION

Construction phase

Step 3: Site-specific mitigation

9.129. The risk of dust impacts, defined in Step 2C of the assessment, are used to determine the mitigation measures required to minimise the emission of dust during construction phase activities. The IAQM guidance[22] provides details of the highly recommended and desirable

mitigation measures which are commensurate with the risk of dust impacts defined in Step 2C for demolition, earthworks, construction and trackout activities. Where the mitigation measures are general in nature, the highest risk category was applied in accordance with the guidance. The highest risk category identified was 'High Risk'. The mitigation measures detailed in Table 9.28 and 9.29 will be included within the Construction Environmental Management Plan (CEMP), a framework CEMP will be submitted as part of the ES of the DCO application.

Table 9.28: Construction phase mitigation measures for a 'High Risk' site

Category	Mitigation Measures	
	Highly Recommended	Desirable
Communications	Develop and implement a stakeholder communications plan that includes community engagement before work commences on site.	None
	Display the name and contact details of person(s) accountable for air quality and dust issues on the site boundary. This may be the environmental manager/engineer or the site manager.	
	Display the head or regional office contact information.	
	Develop and implement a Dust Management Plan (DMP), which may include measures to control other emissions, approved by the Local Authority. The level of detail will depend on the risk, and should include as a minimum the highly recommended measures in this document. The desirable measures should be included as appropriate for the site. The DMP may include monitoring of dust deposition, dust flux, real-time PM_{10} continuous monitoring and/or visual inspections.	
Site Management	Record all dust and air quality complaints, identify cause(s), 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.	None
	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.	None
	Hold regular liaison meetings with other high risk construction sites within 500m of the site boundary, to ensure plans are co-ordinated and dust and particulate matter emissions are minimised. It is important to understand the interactions of the off-site transport/deliveries which might be using the same strategic road network routes.	
Monitoring	Undertake daily on-site and off-site inspection, where receptors (including roads) are nearby, to monitor dust, record inspection results, and make	None

Category	Mitigation Measures	
	Highly Recommended	Desirable
	the log available to the local authority when asked. This should include regular dust soiling checks of surfaces such as street furniture, cars and window sills within 100m of the site boundary, with cleaning to be provided as necessary.	
	Carry out regular site inspections to monitor compliance with the DMP, record inspections results, and make an inspection log available to the local authority when asked.	
	Increase the frequency of site inspections 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 dry or windy conditions.	
Preparing and maintaining the site	Plan the site layout so that machinery and dust causing activities are located away from receptors, as far as is possible.	None
	Erect solid screens or barriers around dusty activities that are at least as high as any stockpiles on site.	
	Fully enclose specific operations where there is a high potential for dust production and the site is active for an extended period.	
	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. If they are being re-used on-site cover as described below.	
	Cover, seed or fence stockpiles to prevent wind whipping.	
Operating vehicle	Ensure all vehicles switch off engines when stationary – no idling vehicles.	None

Category	Mitigation Measures	
	Highly Recommended	Desirable
machinery and sustainable travel	Avoid the use of diesel or petrol powered generators and use mains electricity or battery powered equipment where practicable.	
	Impose and signpost a maximum-speed-limit of 15 mph on surfaced and 10 mph on un-surfaced haul roads and work areas (if long haul routes are required these speeds may be increased with suitable control measures provided, subject to the approval of the nominated undertaker with the agreement of the local authority, where appropriate).	
	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).	
Operations	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.	None
	Ensure an adequate water supply on site for effective dust/particulate matter suppression/mitigation, using non-potable water where possible and appropriate.	
	Used enclose 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 and dry spillages, and clean up spillages as soon as reasonably practicable after the event using wet cleaning methods.	
Waste Management	Avoid bonfires and burning of waste materials.	None

Table 9.29: Mitigation measures specific for demolition, earthworks, construction and trackout

Category	Mitigation Measures	
	Highly Recommended	Desirable
Demolition (High Risk Site)	Soft strip inside buildings before demolition (retaining walls and windows in the rest of the building where possible, to provide a screen against dust).	None
	Ensure effective water suppression is used during demolition operations. Hand held sprays are more effective than hoses attached to equipment as the water can be directed to where it is needed. In addition high volume water suppression systems, manually controlled, can produce fine water droplets that effectively bring the dust particles to the ground.	
	Avoid explosive blasting, using appropriate manual or mechanical alternatives.	
	Bag remove any biological debris or damp down such material before demolition.	
Earthworks (High Risk Site)	Re-vegetate earthworks and exposed areas/soil stockpiles to stabilise surfaces as soon as practicable.	None
	Use Hessian, mulches or trackifiers where it is not possible to re-vegetate or cover with topsoil, as soon as practicable.	
	Only remove the cover in small areas during work and not all at once.	
Construction (High Risk Site)	Avoid scabbling (roughening of concrete surfaces) if possible.	For smaller supplies of fine power materials ensure bags are sealed after use and stored appropriately to prevent dust.
	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 control measures are in place.	
	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.	
Trackout (High Risk Site)	Use water-assisted dust sweeper(s) on the access and local roads, to remove, as necessary, any materials tracked out of the site. This may require the sweeper being continuously in use.	None
	Avoid dry sweeping of large areas.	

Category	Mitigation Measures	
	Highly Recommended	Desirable
	Ensure vehicles entering and leaving the sites are covered to prevent escape of materials during transport.	
	Inspect on-site haul routes for integrity and instigate necessary repairs to the surface as soon as reasonably practicable.	
	Record all inspections of haul routes and any subsequent action in a site log book.	
	Install hard surfaced haul routes, which are regularly damped down with fixed or mobile sprinkler systems, or mobile water bowsers and regularly cleaned.	
	Implement a wheel washing system (with rumble grids to dislodge accumulated dust and mud prior to leaving the site where reasonably practicable).	
	Ensure there is an adequate area of hard surfaced road between the wheel wash facility and the site exit, wherever site size and layout permits.	
	Access gates to be located at least 10m from receptors where possible.	

Operational phase

9.130. A Sustainable Transport Strategy (STS) and Travel Plan (TP) will be submitted with the application and a comprehensive package of on and off-site transport improvements are proposed as part of the Proposed Development. The STS and TP will promote the use of sustainable transport methods such as public transport, walking and cycling to the HNRFI Site to reduce emissions associated with the Proposed Development. The TP is submitted with the PEIR. The following measures will further reduce road traffic emissions associated with the Proposed Development. These measures were not included within the air quality assessment and are therefore additional measures proposed.

- A TP Co-ordinator will be appointed to implement and monitor measures across the Proposed Development;
- Car parking provision will be supplied with charging facilities for Electric Vehicles with ductwork provision for future car charging points on all remaining car parking spaces. This will encourage the use of EV for staff commuting to work;
- The yard areas will be future proofed for the future installation of Heavy Goods Vehicle (HGV) charging points;
- Provision of covered cycle parking facilities;

- New and improved walking and cycling routes are proposed both on and off-site:
- Shared pedestrian and cycleway on the new A47 link road through the HNRFI Site;
- Potential enhancements to B4669 east of the M69 to Sapcote; andThe Proposed Development also seeks to improve bus accessibility to the HNRFI Site by enhancing local bus services.

9.131. The measures above aim to reduce emissions associated with the Proposed Development and encourages the use of sustainable methods of transport. Any reduction in emissions will be beneficial to both human and ecological receptors.

RESIDUAL ENVIRONMENTAL EFFECTS

Construction phase dust assessment

Step 4: Determine significant effects

9.132. In accordance with IAQM guidance[22], with the implementation of the mitigation measures detailed in Tables 9.28 and 9.29, the residual impacts from the construction phase are considered local, medium term, temporary and 'not significant'.

Operational phase road traffic emissions assessment

Human receptors

9.133. A negligible impact is predicted at receptors as a result of the development-generated road traffic emissions. The residual impacts are predicted to be local, permanent and 'not significant'.

Ecological receptors

Critical level

9.134. Within the ecological designations exceedances of NOx were predicted in the 2026 Opening Year scenarios and 2036 Future Year scenarios adjacent to the M1 for three sites. The results of the assessment were referred to the appointed ecological consultants for analysis.

Critical load

9.135. The predicted changes in nitrogen deposition for three sites were referred to the appointed ecological consultants to determine the significance. The results are discussed in Chapter 12: *Ecology and Biodiversity.*

CUMULATIVE AND IN-COMBINATION EFFECTS

9.136. There are two types of cumulative effects, intra-project effects, combined effects from the Proposed Development on sensitive receptors such as dust, noise and visual effects and inter-project effects, the combined effects of the Proposed Development with other development site(s) which may be insignificant individually but combined can create a significant effect.

Construction phase

9.137. The construction phase dust assessment, was undertaken for the Proposed Development in accordance with IAQM guidance[22] and considers potential dust impacts arising during construction for human and ecological receptors within 350m of the Order Limits. Construction phase activities associated at other sites within 700m of the Proposed Development have the potential to occur simultaneously with construction phase activities associated with the Proposed Development, cumulative dust impacts could occur.

9.138. No committed developments were located within 700m of the Order Limits and are outside the area of consideration for the construction phase dust assessment. It is therefore considered that the cumulative impacts associated with the construction phase are 'not significant' and no further mitigation measures are required. The location of committed developments will be reviewed during the preparation of the ES and the assessment revisited where applicable.

Operational phase

9.139. The traffic data provided for use in the AQA includes cumulative traffic flows for the study area including those detailed within Chapter 8: *Transport and Traffic*. Therefore, no additional cumulative road traffic emissions impact assessment was undertaken, as cumulative impacts were considered within the operational phase road traffic assessment. This provides a conservative assessment for both human and ecological receptors.

CLIMATE CHANGE

9.140. Climate change is caused by the emissions of greenhouse gases changing the general weather conditions prevailing over a long period of time. The impacts of climate change can therefore be considered in terms of volume of greenhouse gas emitted by the Proposed Development.

9.141. The Proposed Development will provide a major shift from road transport to rail. A report by the Strategic Rail Business Case Advisors, Baker Rose Ltd reviewed the HGV mileage saved per annum. Chapter 18 of this PEIR report sets-out the effects of the Proposed Development on Climate Change.

SUMMARY AND CONCLUSIONS

Construction phase

9.142. A qualitative construction phase dust assessment was undertaken and measures were recommended for inclusion in a CEMP to minimise emissions during construction activities. With the implementation of these mitigation measures the impact of construction phase dust emissions is considered to be 'not significant' in accordance with IAQM guidance[22].

Construction phase road traffic

9.143. Details of the construction phase road traffic associated with the Proposed Development were not known at the time of assessment. A detailed construction phase traffic emissions assessment was therefore not undertaken at this stage. This will be revisited through the ES in time for submission of the DCO application.

Operational phase

Operational phase road traffic emissions assessment- human receptors

9.144. A detailed road traffic emissions assessment was undertaken to consider the impact of development-generated road traffic on local air quality at identified existing human receptor locations within the study area. This included cumulative traffic flows for the study area as detailed within Chapter 8: *Traffic and Transport*. Road traffic emissions were modelled using the dispersion model ADMS-Roads and concentrations of NO_2, PM_{10} and $PM_{2.5}$ were predicted at identified sensitive receptor locations within the study area. The modelling assessment was undertaken in accordance with DEFRA guidance. Changes in pollutant concentrations were determined and the impact of the development on local air quality at identified human receptors was predicted to be negligible and 'not significant' in accordance with IAQM and EPUK guidance[23].

9.145. Table 9.30 contains a summary of the likely significant effects of the Proposed Development.

Operational phase road traffic emissions assessment- ecological receptors

Critical level

9.146. A critical level assessment was undertaken to consider the impact of the Proposed Development on ecological designations within the study area. In accordance with DMRB guidance[21], transect points were modelled within each of the designations. Concentrations of NOx were predicted and compared to the NOx critical level for ecosystems. Exceedances of the critical level were predicted at Shawell Wood, Martinshaw Wood and Piper Wood AWs and the results were referred to the appointed ecological consultants.

Critical loads

9.147. A critical load assessment for nitrogen deposition was also undertaken to consider the impact of the Proposed Development on the designated sites within the study area. Transects were modelled within each designation, in accordance with DMRB guidance[21]. The percentage change in nitrogen critical loads, as a result of the development was calculated for 2026 Opening Year and for 2036 Future Year Without and With Development scenarios. The results of the assessment were referred to the appointed ecological consultants to determine any potential impact.

Rail emissions

9.148. An assessment of the potential effects of rail emissions was undertaken in accordance with DEFRA guidance[20]. It was determined that the Proposed Development would not exceed any of the screening criteria detailed for rail locomotives and therefore the impacts on local air quality from rail emissions as a result of the operational development are deemed to be negligible and 'not significant'.

Table 9.30: Summary of environmental effects (air quality)

Potential Effect	Receptor*	Nature of Effect**	Sensitivity of Effect***	Magnitude of Effect****	Significance of Effect^	Mitigation	Residual Effect
Construction							
Dust Soiling from Construction Phase	Local	Short term and Temporary	High	Major	Not defined in accordance with IAQM guidance	Dust Mitigation Measures within CEMP	Not Significant
Dust impact from Construction Phase on Human Health	Local	Short term and Temporary	Medium	Major	Not defined in accordance with IAQM guidance	Dust Mitigation Measures within CEMP	Not Significant
Dust Impacts on Ecological Receptors	Local	Short term and Temporary	High	Major	Not defined in accordance with IAQM guidance	Dust Mitigation Measures within CEMP	Not Significant
Operation							
Emissions from Development Traffic on Human Health	Local	Long term and Permanent	High	Not Defined	Negligible	Comprehensive package of on and off-site transport improvements; Sustainable Transport Strategy, Travel Plan and EV charging	Not significant
Emissions from Development	Local	Long Term and Permanent	Please see Chapter 12: *Ecology and Biodiversity* for the assessment of ecological receptors				

Potential Effect	Receptor*	Nature of Effect**	Sensitivity of Effect***	Magnitude of Effect****	Significance of Effect^	Mitigation	Residual Effect
Traffic on Ecological Receptors							

** International; United Kingdom; England; Regional; County; Borough; Local*

*** Permanent or Temporary/Direct or Indirect*

**** High, Moderate or Low*

*****Major, Moderate, Minor or Negligible*

^ Major, Moderate, Minor or Negligible/Adverse or Beneficial

Tritax Symmetry (Hinckley) Limited

HINCKLEY NATIONAL RAIL FREIGHT INTERCHANGE

Preliminary Environmental Information Report

Chapter 10: Noise and vibration

January 2022

This document forms a part of a Preliminary Environmental Information Report (PEIR) for the Hinckley National Rail Freight Interchange project.

A PEIR presents environmental information to assist consultees to form an informed view of the likely significant environmental effects of a proposed development and provide feedback.

This PEIR has been prepared by the project promoter, Tritax Symmetry (Hinckley) Limited. The Proposed Development is described in Chapter 3 of the PEIR and is the subject of a public consultation running from 12 January to 9 March 2022.

Details of how to respond to the public consultation are provided at the end of Chapter 1 of the PEIR and on the project website:

http://www.hinckleynrfi.co.uk/

This feedback will be taken into account by Tritax Symmetry (Hinckley) Limited in the preparation of its application for a Development Consent Order for the project.

Chapter 10 ◆ Noise and vibration

INTRODUCTION

10.1. In accordance with guidance[1], the information presented in this Chapter is considered 'preliminary'; the PEIR submission forms an integral part of an iterative process for both the design of the Proposed Development and the EIA and will therefore take into consideration any comments received through this consultation.

10.2. This Chapter assesses the likely significant effects of the Proposed Development in respect of noise and vibration. It considers the potential effects of noise and vibration impacts associated with the construction, excluding construction traffic, and operation of the Proposed Development. This Chapter describes the methods used to assess the impacts, the baseline conditions currently existing at the site and surroundings, the potential direct and indirect impacts of the development arising from noise and vibration, the mitigation measures required to prevent, reduce, or offset the impacts and the residual impacts. It has been written by BWB Consulting Ltd. All contributors to the Chapter hold relevant acoustic qualifications, are experienced in the assessment of environmental noise and vibration and are Members of the Institute of Acoustics (IOA).

10.3. Whilst every effort has been made to ensure that this Chapter is easy to understand, it is necessarily technical in nature. Therefore, to assist the reader, a glossary of terminology is included in Appendix 10.1.

10.4. A full description of relevant policy, standards and guidance is provided in Appendix 10.2.

METHODOLOGY AND DATA SOURCES

Scoping opinion

10.5. Consultation has been undertaken in the form of the project's Scoping Report which was issued to statutory consultees. The scoping opinion has been received and the response in relation to noise and vibration is detailed below in Tables 10.1 and 10.2.

Table 10.1: EIA scoping and commentary

ID	Ref	Point	Comments	Response
4.4.1	9.36	Road Links – Vibration during	The Scoping Report proposes to scope out operational vibration impacts for the proposed new	This is agreed, no further action is required.

[1] The Planning Inspectorate (May 2020): Advice Note Seven (Version 7); Environmental Impact Assessment: Process, Preliminary Environmental Information and Environmental Statements

ID	Ref	Point	Comments	Response
		operation	roads. Considering that a resurfaced road surface / new road will be free of irregularities as part of project design and under general maintenance, the Inspectorate agrees that an assessment of operational vibration can be scoped out on this basis.	
4.4.2	9.16	Baseline	The Scoping Report appears to describe the baseline in relation to the main interchange site only. The ES must describe the baseline environment surrounding all relevant proposed works (including the bypass and works to the M69 Junction 3 /M1 Junction 21).	A review has been undertaken of the off-site road links. This indicates that for the majority of the junctions, there is unlikely to be an impact from a noise perspective. Potential impacts have been identified for junctions 19 and 29, and are detailed in Paragraph 10.184.
4.4.3	9.24	Construction phase road traffic noise	The Scoping Report does not clearly state whether the ES will assess road traffic noise during construction. The ES should assess impacts associated with road traffic noise where significant effects are likely to occur.	Where significant effects are likely to occur due to road traffic noise associated with the construction phase, these will be considered within the ES. These will be assessed following the principles of DMRB LA111, referencing Table 3.17 of that document. Further detail is provided in Paragraph 10.87.
4.4.4	9.25	Operational phase rail movements	The Scoping Report states that the ES will assess rail noise from rail movements within the site. Should an increase in rail movements off site lead to significant noise and vibration effects these should also be assessed.	Where significant effects are identified, an assessment will be undertaken.
4.4.5	9.25	Operational phase vibration	The Scoping Report states that the ES will assess noise arising from operational service yard	Service yard activities are likely to include vehicle movements, storage,

ID	Ref	Point	Comments	Response
		from service yard activity	activities. The potential for vibration during operation has not been addressed. The ES should assess impacts associated with operational vibration where significant effects are likely to occur.	loading/unloading of vehicles including HGVS, all of which are unlikely to cause significant levels of vibration. However, the nearest sensitive receptor is located at least 90m away from the redline boundary of the Main HNRFI Site. Therefore, vibration from operational service yard activities is unlikely to be significant, and does not warrant consideration within the assessment. It is considered that the additional movements associated with the rail freight interchange are unlikely to result in a significant change in the level of vibration currently experienced at nearby sensitive receptors. The proposed rail lines associated with the interchange are likely to be at a greater distance than the existing rail line and given the stage of the application, the detail required to undertake an assessment of vibration impacts is unlikely to be available. It is therefore considered that operational vibration associated with the proposed rail interchange is unlikely to be significant and does not warrant consideration at this stage. This is addressed

ID	Ref	Point	Comments	Response
				further in paragraphs 10.151 to 10.154.
4.4.6	9.30	Tranquility assessment	The Scoping Report states that "where required, a tranquility assessment will be undertaken". It is not explained under which circumstances this will be undertaken or what the scope of such an assessment would be. The ES should consider the impact on the tranquility in open spaces across the 6lifetime of the scheme, where significant effects are likely to occur. The Scoping Report states that a suitable approach will be derived and agreed with the relevant consultees and stakeholders. This should be explained in the ES and it should be clear how stakeholder engagement has informed the assessment.	A tranquillity assessment has been included within the following assessment, and is detailed in paragraphs 10.181 to 10.196. Although various approaches have been put forward in the past to determine the impact of a development on tranquillity, there is no industry standard approach. Therefore, we propose to develop a methodology drawing on multiple sources such as local open space policies, BS 8233:2014, WHO Guidelines (1999), CPRE Tranquillity Map for England, and other web-based tranquillity tools. Areas such as open spaces, public footpaths, local reserves etc would be considered within any assessment.

Table 10.2: Consultee commentary and advice

Consultee	Comments	Response
Blaby District Council (BDC)	The methodology and choice of noise receptors should be agreed with the Environmental Health Department of BDC	Further consultation has been undertaken and the methodology and noise sensitive receptors have been agreed with BDC.
	Noise impacts on people should be specifically addressed and particularly any noise disturbance at night and other unsocial hours such as weekends and public holidays	Weekend periods have been considered within the following assessment, along with noise impacts during the night-time. It is considered that a weekend period will be similar to a public

Consultee	Comments	Response
		holiday. Baseline monitoring has been undertaken to cover a weekday and weekend period and operational noise associated with the Proposed Development has been assessed against each period. It has been assumed that the weekend operations will be the same as those on a weekday.
	With regard to noise, a number of residential properties to the west of Elmesthorpe are known to be exposed to road traffic noise from the A47 and its junctions. The Environmental Statement (ES) should include these properties in its assessment of both the construction and operational phases.	The assessment will include receptors located along Billington Road, which are located closer to the Main HNRFI Site than those properties located within Elmesthorpe. Therefore, it is considered that any impact from the construction and operational phases is likely to be less at properties in Elmesthorpe, than at those receptors identified within the assessment. Therefore, receptors located further away than Billington Road will not be included within the following assessment. Any re-routing of traffic as a result of the Proposed Development is captured within the traffic data and has been assessed in line with the pertinent guidance.
	The ES should consider the effects of construction and operational phases of the proposed development for both night and day. It should state how noise generated by each element of the proposed development has been evaluated. Any assumptions underlying the evaluation of potential impacts should be stated. Noise contour maps would be welcomed to report the assessment of noise generation.	The assessment will consider noise from the construction phase of the Main HNRFI Site during the daytime. Motorway works, particularly those concerning Junction 2 of the M69 will likely be undertaken during the night-time. However, , this will be agreed with National Highways and will likely be subject to their noise and vibration requirements to ensure appropriate control measures are

Consultee	Comments	Response
		put in place.
	Consideration should be given to monitoring noise complaints during construction and when the development is operational.	Any noise complaints received during the construction phase would be managed in line with the CEMP.
Sharnford Parish Council	Houses in Sharnford are less than 1.0 metre from the B114 with cracks in walls and excessive noise.	The potential effect of additional road traffic associated with the proposed development will be assessed, and mitigation will be recommended where adverse impacts are identified.
Stoney Stanton	Operational Phase – Rail Freight Interchange – although many British Standards are quoted, this section does not make any specific mention of the fact that 24 hour, 7 day per week operation is expected, whereas at the moment no such operations take place. The ES should specifically consider noise generated at night time which is likely to have an impact over a larger area than daytime noise.	The noise and vibration assessment has considered the proposed operations over 24 hours a day, 7 days a week.
	Section 9.16 – states "dominant source of noise is likely to be from road traffic on the M69 to the south and east and existing rail movements on the railway line to the northwest". This should be refined as assessment at the DIRFT facility locally it is clear that the shunting of trains and loading and unloading of containers can easily be heard above the sound of the M1 and A5. This statement should be reassessed.	This refers to existing baseline conditions. i.e. prior to development. Noise associated with the Proposed Development is assessed against the existing baseline noise climate to determine any potential impacts.
	Section 9.23 states that a baseline noise assessment will be conducted but not how this will be done and what assessment criteria will be used for the locations.	This is detailed within the technical note NTT2814 – Hinckley Survey Method Statement_Issue_P02, which has been submitted to and agreed with, BDC and Hinckley and Bosworth Borough Council. This document can be found in Appendix 10.3.
	Section 9.33 references short term but fails to clarify that with a meaning	This is addressed within this PEIR document

Consultee	Comments	Response
	full statement. This needs to state the use and definition of short term in respect to this comment. It also states "….controlled through a suitably worded CEMP", this should read the 'execution of a suitable CEMP' as it implies in its current form that a document is all that is required to mitigate issues.	The CEMP details the control measures in place and has to be followed during the construction phase.
	Section 9.36 refers to the scoped out vibration analysis of the road and how this will be detrimental and could bas assessed as an adverse effect. Given that there are new proposed roads to be built the makeup of the ground should be sampled and the determination of makeup used to ensure this section is scoped in. Furthermore the re-surfacing of existing roads, whilst welcome will only assess the road in an as new condition and not the likely condition for the life span of the road, there for an as new assessment of the road should be replaced with a typical condition of road. Finally where an existing road is re-surfaced but the type and volume of traffic changes as a result of any part of this assessment change the vibrations from the road then this should be factored in. Given how close to people's home, and villages that this will be this section should be scoped in with the required works completed.	It has been agreed within the scoping opinion provided by The Planning Inspectorate (PINS) that vibration from road traffic does not need to be considered within the noise and vibration assessment. The scoping report states the following; '*The Scoping Report proposes to scope out operational vibration impacts for the proposed new roads. Considering that a resurfaced road surface / new road will be free of irregularities as part of project design and under general maintenance, the Inspectorate agrees that an assessment of operational vibration can be scoped out on this basis'*.
Burbage Parish Council	It is possible that soil conditions require the use of high noise techniques such as pile driving. The ES should specifically consider the impact of construction noise and mitigation to ensure no long term impact on local wildlife occurring whilst the site is under construction.	The assessment has considered the construction methods to be undertaken. Liaison with the project's ecologists has confirmed that noise from the construction phase does not need to be considered at ecological receptors. Please see chapter 12.
	It is likely that there will be considerable noise generated by	The noise assessment will consider the potential

Consultee	Comments	Response
	operations at the site, including but not limited to steady beeping of reversing vehicles.	operational noise impact as a result of the proposed development, and recommend mitigation where required.
	Consideration should be given to the stability of the ground for large structures and if this is leading to pile driving activity which can cause extreme noise concerns. The ES should include the results of a full study all such noise pollution (during construction and operation), which should specifically include the impact upon: • Immediate residents of the proposed development, • Members of the public enjoying the amenity space of Burbage Common, woods and surrounding areas, • All wildlife in the woods and common, • The new crematorium being built near Leicester Road, Hinckley, Consider the impact of the above on night time operations.	The construction phase assessment has accounted for piling activities. Further details can be found in paragraphs 10.81 to 10.91 and associated tables. The noise assessment has considered the potential noise impact as a result of the proposed development, on the identified receptors, which have been agreed with BDC and Hinckley and Bosworth Borough Council. Liaison with the project's ecologist has confirmed that noise from the construction and operational phase does not need to be considered at ecological receptors. The new crematorium will be considered, however given that there are receptors located much closer to the Proposed Development, any impact is likely to be less at the crematorium, than at those receptors identified within the assessment. Night-time operations will be considered within the assessment.
Elmesthorpe Parish Council	The applicant states that the study area will be defined and agreed with the Local Authority and relevant stakeholders, however there is no definition of 'relevant stakeholders'. This is a cause of concern as the Applicant previously suggested a study area which the Parish Council considered to be inappropriate. The ES should include an assessment of all areas that are likely to be affected.	The receptors to be included within the assessment have been agreed with BDC and Hinckley and Bosworth Borough Council, which cover the area of Elmesthorpe. The study area will include all areas which are likely to be affected by the proposals.

Consultee	Comments	Response
Highways England (HE)	Adverse change to noise and air quality should be particularly considered, including in relation to compliance with the European air quality limit values and/or in any local authority designated Air Quality Management Areas (AQMAs).	The potential noise effect of additional road traffic associated with the proposed development will be assessed. The air quality issues are addressed in Chapter 9 of the PEIR.
Public Health England	As the application is for a road-rail interchange development, we have included guidance on the effects of noise on public health and wellbeing in Appendix 2. Our guidance pertaining to noise is informed by the recommendations in the 2018 Environmental Noise Guidelines for the European Union published by the World Health Organisation (WHO) and high-quality systematic reviews of scientific evidence.	The assessment will consider Appendix 2. The 2018 Environmental Noise Guidelines for the European Union are largely concordant with 1999 Guidelines for Community Noise. The 2018 guidelines state in section 2.6 '*The current environmental noise guidelines for the European Region supersede the CNG from 1999. Nevertheless, the GDG recommends that all CNG indoor guideline values and any values not covered by the current guidelines (such as industrial noise and shopping areas) should remain valid*.' The criteria to be achieved internally is similar. The criteria for external spaces is reported as a L_{den}, which is not widely used in the United Kingdom. Therefore, in the absence of any other relevant criteria, the following assessment will adopt the metrics within BS 8233.

10.6. In addition to the above, consultation has also been undertaken with the Environmental Health Department at Blaby District Council (BDC) and Hinckley and Bosworth Borough Council (HBBC) to agree the proposed noise and vibration assessment methodology. Table 10.3 provides a summary of the consultation undertaken.

Table 10.3: Consultation with Blaby District Council (BDC) and Hinckley and Bosworth Borough Council (HBBC)

Consultee	Date	Comments	Actions
BDC	12th February 2021	As you may be aware, I was satisfied with the methodology that was proposed in 2018. I advised that that there are a number of different land holdings/caravan sites in the Aston Firs area. You may wish to consider any implications for your impact assessment.	The caravan and mobile homes sites, have been included as sensitive receptors within the assessment.
	5th March 2021	I am generally satisfied with your stated methodology, including proposed method of allowing for the impact of Covid-19 restrictions. I note your proposals with regards to a tranquillity assessment, and would be happy to discuss these by phone. However I cannot see any issues with them. BDC does not have specific criteria to be achieved with regards to BS 4142. Please find attached a planning guidance document that we regularly send to applicants with respect to noise requirements. In addition, the receptors that you have identified appear to be reasonable, and the monitoring locations likely to be representative of them. In terms of local roads, in order to answer your query as to whether there are any additional roads that I would wish to be included in the assessment, it would be useful if you could provide a plan showing the roads currently proposed to be included. I look forward to hearing from	Although the comments indicate that there are no issues with the proposed approach, following the submission of the PEIR document, specific comments will be sought from BDC on the PEIR's tranquillity assessment approach and conclusions. Consideration will be given to the planning guidance document. Following submission of the PEIR document, further consultation will be undertaken with BDC regarding the local roads included within the assessment.

Consultee	Date	Comments	Actions
		you with regard to the local roads. Perhaps you could suggest some dates and times that are suitable to you for discussing the tranquillity assessment.	
Hinckley and Bosworth Borough Council	26th March 2021	A concern was raised regarding the receptor on the junction of Sapcote Road and Smithy Lane. A concern was also raised regarding the receptor at Houston Lodge	It was agreed that these receptors were to be scoped out of the assessment, and the following was received *'The methodology appears fine.* *Houston Lodge is on Burbage Common Road. The assessment at Basset Cottage and Bridge Farm should address any issues there*'.

10.7. Public consultation was undertaken with the public in 2018/2019 and noise and vibration was discussed. Concerns were raised regarding potential noise and vibration impacts and this PEIR chapter considers the potential impacts of the Proposed Development on nearby receptors.

Definition of the study area

10.8. The study area includes receptors that are adjacent to the Proposed Development, including the proposed A47 link road, and varies for the source under consideration.

10.9. For the construction and rail freight interchange operations, which are localised to within the Main Order Limits, the closest receptors have been included within the study area. As noise and vibration levels reduce with distance, it is considered that receptors located at a greater distance from the Proposed Development will experience a lower impact.

10.10. For off-site rail movements, an initial the assessment will be undertaken for a notional receptor, 25m from the line, in accordance with Calculation of Railway Noise (1995)[2]. Where this initial assessment identifies an effect of moderate adverse and above, then the study area will be extended to include Stoney Stanton to the northeast and the outskirts of Hinckley to the southwest. This would represent a study area of 2.2km.

10.11. For the assessment of road traffic generated by the Proposed Development, the pertinent

[2] Department for Transport (1995), Calculation of Railway Noise

guidance states that where a project is likely to cause a change in the Basic Noise Level (BNL) of 1dB $L_{A10,18hr}$ as a result of the project opening, or there would be reasonable stakeholder expectation that an assessment would be undertaken, then the assessment shall make a recommendation on the scope of further assessment. Therefore, all roads within a 10km radius that are likely to experience an increase of 1dB $L_{A10,18h}$ will be included within the assessment. Road traffic will dissipate on the existing road network as distance increases from the site. Any adverse impacts are likely to occur closer to the Proposed Development, which will reduce with distance. Therefore, there is unlikely to be a significant adverse effect experienced at a distance greater than 10km from the Proposed Development site.

Scope

10.12. The assessment includes the following scope of works:

- the effect of noise and vibration resulting from the construction phase of the Proposed Development, including on-site activities on existing noise and vibration sensitive receptors.
- the effect of noise resulting from the operational phase of the freight interchange, including proposed rail movements, heavy goods vehicle (HGV) movements, loading/unloading operations, fixed, mobile plant and break-out noise, and off-site road traffic impacts associated with the Proposed Development, including re-routing of traffic and development generated road traffic;
- the effect of noise and vibration resulting from proposed off-site rail movements;
- the effect of operational noise on local tranquillity; and,
- the effect of noise as a result of the proposed A47 link road.

Construction noise

10.13. The construction works are likely to be divided into a number of ground preparation and construction phases, including:

- excavation and substructure works (including some possible piling, although the need for this and locations are not yet known);
- rail works;
- plateau and bund formation;
- drainage works;
- superstructure and building envelopes;
- fitting out; and

- hard landscaping/highways infrastructure.

10.14. At the planning stage, before the appointment of a contractor, details on the construction activities, detailed programme or number and type of construction plant are not fixed. Nevertheless, an indicative quantitative and qualitative construction noise assessment at local Sensitive Receptors (SRs) was undertaken, taking account of the guidance in BS 5228-1 Code of practice for noise and vibration control on construction and open sites part 1:Noise[3], based on worst-case and average case scenarios and best practice mitigation measures.

10.15. The assessment of potential construction noise thresholds at residential properties was undertaken with reference to 'example method 1 – the ABC method' as defined in BS 5228-1. Table 10.4 provides guidance in terms of appropriate threshold values for existing residential receptors, based upon predicted noise levels. This method was chosen as it references the measured noise levels at the receptors and predicts the likely impact based on the existing noise at a given receptor.

10.16. Based upon the BS 5228 ABC method, the criterion which will be adopted in this assessment for the onset of potentially significant effects is the exceedance of the $L_{Aeq,T}$ threshold level for the category appropriate to the ambient noise level at Noise Sensitive Receptors (NSRs).

10.17. The magnitude of the impact of construction noise is classified in accordance with the descriptors in Table 10.4.

Table 10.4: Construction Noise Magnitude of Impact

Criteria	Magnitude of Impact
Exceedance of ABC Threshold Value by more than 5 dB	High
Exceedance of ABC Threshold Value up to 5 dB	Medium
Equal to or below the ABC Threshold Value by up to 5 dB	Low
Below the ABC Threshold Value by more than 5 dB	Very Low

Construction Traffic

10.18. The Design and Manual for Roads and Bridges (DMRB) LA111[4] states that the magnitude of impact at noise sensitive receptors for construction traffic is assessed against a change in the Basic Noise Level (BNL). An increase equal to or greater than 3dB in the BNL would be an indication of a moderate to major adverse impact for a duration exceeding 10 or more days or nights in any 15 consecutive days or nights, or a total number of days exceeding 40 in any 6 consecutive months.

10.19. Construction trips for similar sites at East Midlands Gateway and Northampton Gateway

[3] British Standards Institute (2014), BS5228-1:2009+A1:2014 – Code of practice for noise and vibration control on construction and open sites. Part 1:Noise

[4] Highways Agency (2020), Design Manual for Roads and Bridges (DMRB) LA111 Noise and Vibration Revision 2

indicate likely construction vehicle numbers at around 10-15% of the total forecast daily operational traffic flows predicted for the HNRFI Site. The trip rates from these sites have been used to forecast initial construction traffic movements for the earliest phases, when impacts will be most keenly felt on local roads.

10.20. Indicative distribution figures from potential contractors have been provided to understand likely routing of vehicles ahead of the completion of the south facing slip roads and the A47 link road. This estimates around 60% of construction traffic will route from the M69 southbound on the existing slips. The remaining 40% from the B4669 to the west and east of the site access split equally.

10.21. Once the slips are in operation after the first year of construction, followed by completion of the A47 link, then construction traffic will be focused on the strategic road network to avoid unnecessary impacts on local roads.

10.22. A quantitative assessment of construction traffic was not undertaken as part of the PEIR as phasing is subject to further detailed considerations. Construction phase traffic will be considered further in the ES accompanying the DCO application.

Construction vibration

Effects on humans

10.23. Construction vibration has the potential to impact upon occupants of buildings within the vicinity of the works. BS 5228-2 Code of practice for noise and vibration control on construction and open sites Part 2:Vibration[5] provides guidance on the perception of vibration within occupied buildings and provides a simple method of determining annoyance alongside evaluation of cosmetic damage associated with vibration.

10.24. The potential impact depends on the type of activity, ground conditions, and distance to NSRs. As part of the Proposed Development, it is anticipated that piled foundations will be necessary in some areas, and this will be determined at the detailed design stage. Notwithstanding this, a qualitative assessment has been undertaken to determine the likely impact at set distances upon key sensitive receptors from the proposed plant under the worst case scenario.

10.25. The following criteria set out in Table 10.5, was adopted and is based upon the guidance on effects of vibration levels applicable to human perception as presented within BS 5228. The corresponding vibration ranges and associated magnitude of effect ratings adopted for the purpose of this assessment have also been included within Table 10.5.

[5] British Standards Institute (2014), BS5228-1:2009+A1:2014 – Code of practice for noise and vibration control on construction and open sites. Part 2:Vibration

Table 10.5: Magnitude of effect applicable to construction vibration – Applicable to human perception

Vibration level	Effect	Magnitude of effect
>10.0 mm/s	Vibration is likely to be intolerable for any more than a very brief exposure to this level	High
1.0 ≤ 10.0 mm/s	Onset of complaints in residential environments	Medium
0.3 ≤1.0 mm/s	Onset of perceptibility in residential	Low
< 0.3 mm/s	Unlikely to be perceptible in residential environments	Very Low

Effects on buildings

10.26. In addition to human annoyance, building structures may be damaged by high levels of vibration. BS 6472-1:2008: Guide to evaluation of human exposure to vibration in buildings Part 1: Vibration sources other than blasting[6] states that '*the likelihood of building damage is very low even when vibration levels are well above perception thresholds*'. Consequently, if vibration levels are controlled to those relating to annoyance then it is highly unlikely that buildings will be damaged by construction vibration levels.

Completed development assessment

Noise from fixed plant, equipment and noise break-out from buildings

10.27. It is anticipated that there may be fixed plant and equipment associated with the Proposed Development that may have the potential to generate noise. There may also be noise break-out from proposed buildings. However, at this stage , details of the proposed type, number and precise location of any such plant or the nature of its operation are not available. In the absence of detailed information, it is appropriate to specify suitable noise control limits to which any plant and operations should conform. These limits, as detailed in Table 10.42, should include any appropriate corrections for acoustic characteristics, in accordance with BS 4142 Methods for rating and assessing industrial and commercial sound[7].

10.28. It is considered that the rating level of fixed plant noise sources should not exceed the prevailing background sound level when measured at the nearest NSRs. The cumulative effect of all external plant and activities should be specified so that the rating level is less than or equal to the lowest prevailing background sound level.

10.29. Therefore, the approach taken specifies suitable mechanical and electrical plant item noise limits for the site in accordance with the above.

[6] British Standards Institute (2008) BS6472-1-2008 Guide to evaluation of human exposure to vibration in buildings
[7] British Standards Institute (2014+A1:2019), BS4142 Methods for rating and assessing industrial and commercial sound

Table 10.6: Magnitude of effect applicable to noise from fixed plant, equipment and noise break-out

Difference between rating level ($L_{Ar,Tr}$) and background sound level ($L_{A90,T}$)	Magnitude of impact
≥+9	High
+4 ≤ +8	Medium
0 ≤ +3	Low
≤-1	Very Low
Subject to a lower cut-off of 35 dB as a rating level in accordance with BS 4142:1997 (See paragraph 9.94) *+ indicates rating level above background sound level* *- indicates rating level below background sound level*	

Noise from HGV deliveries and service yard activities including the intermodal rail facility

10.30. In order to determine the magnitude impact from HGVs arriving, loading/unloading and departing and service yard activities, including the intermodal rail facility, an assessment in accordance with BS 4142 has been adopted, and Table 10.6 sets out the criteria against which this potential noise impact will be assessed.

10.31. In addition to the criterion detailed in Table 10.6, BS 4142 goes onto state that 'the significance of sound of an industrial and/or commercial nature depends upon both the margin by which the rating level of the specific sound source exceeds the background sound level and the context in which the sound occurs'.

10.32. Therefore, to determine the resultant effect as a result of operational noise, sound rating levels will be compared to the existing noise climate at each receptor. The effect is determined by the change in noise level, with changes of 3dB being only just perceptible under laboratory conditions. This relates to noise that is continuous and similar in nature to the existing noise, however by using the rating level, rather than the specific level accounts for this.

Operational maximum noise levels

10.33. The potential effects of operational maximum noise levels from the operational phase of the SRFI will be assessed in accordance with World Health Organisation (WHO 1999) Guidelines for community noise[8] and WHO Environmental Noise Guidelines for the European Region (2018)[9].

[8] World Health Organisation (WHO) (1999), Guidelines for Community Noise
[9] World Health Organisation (2018), Environmental Noise Guidelines for the European Region

Table 10.7: Magnitude of effect applicable to L_{AFmax} levels

Exceedance of criteria	Magnitude of impact
Exceedance of criteria by more than 5 dB	High
Exceedance of criteria up to 5 dB	Medium
Equal to or below the criteria by up to 5 dB	Low
Below the criteria by more than 5 dB	Very Low

Noise from on-site rail movements

10.34. As rail movements within the site will mainly be associated with shunting movements, which will be low speed, the noise source will be assessed in accordance with BS 4142:2014+A1:2019.

Noise from off-site rail movements

10.35. There are a number of indices that can be used to measure noise from the operation of a railway, and it is therefore important to identify those which most closely correlate with people's response when exposed to rail noise. The general consensus, which is backed-up by a number of studies and is reflected in legislation, standards and guidance, is that annoyance correlates best with the measure of equivalent continuous sound level (L_{Aeq}). This is the continuous sound level, which would give the same noise energy as received from fluctuating noise.

10.36. The assessment of noise from off-site rail movements will consider the change in noise level between the baseline scenario and a 'future' scenario, for the daytime and night-time periods. The predicted noise levels will be calculated in accordance with CRN, based on the types of trains using the line. CRN does not state a parameter and therefore the assessment will assume a change in the absolute noise level. The assessment will be undertaken at a notional distance 25m from the existing line in accordance with CRN.

10.37. A change in the noise level of 3dB $L_{Aeq,T}$ or greater is generally considered to result in a noticeable change, and has been adopted when assessing the potential impact of HS2. The Guidelines for Environmental Noise Impact Assessment (IEMA)[10] includes an impact classification for determining the impact from the change in sound levels. The adopted criteria is shown below in Table 10.8, and is based on the IEMA guidelines taking into account other pertinent guidance.

[10] Institute of Environmental Management and Assessment, Guidelines for Environmental Noise Impact Assessment, Version 1.2 (November 2014).

Table 10.8: Impact scale for comparison of future noise against existing noise

Change in noise level dB (A)	Subjective response	Magnitude of impact
10.0+	Noticeable and disruptive	High
3.0 to 9.9	Noticeable and potentially intrusive, particularly at higher end of scale	Medium
1.0 to 2.9	Noticeable but unlikely to be intrusive	Low
0.1 to 0.9	Unlikely to be noticeable	Very Low

Vibration from off-site rail movements

10.38. Potential impacts as a result of off-site vibration from additional rail movements will be assessed in accordance with BS 6472-1:2008: Guide to evaluation of human exposure to vibration in buildings Part 1: Vibration sources other than blasting[11]. The criteria set is detailed below in Table 10.9.

Table 10.9: Magnitude of impact for vibration as a result of proposed rail movements

Night-time Vibration Dose Value (VDV), $m/s^{1.75}$	Daytime Vibration Dose Value (VDV), $m/s^{1.75}$	Magnitude of impact
>0.51	>1.6	High
0.26 – 0.51	0.80 – 1.6	Medium
0.13 – 0.25	0.20 – 0.79	Low
<0.13	<0.20	Very Low

Development generated road traffic

10.39. An increase in road traffic due to the Proposed Development has the potential to increase the road traffic noise levels at NSRs in the vicinity of the Proposed Development for both the short-term and the long-term.

10.40. Traffic data has been provided as 18-hour Annual Average Weekday Traffic (AAWT) by BWB Consulting Ltd for the following scenarios:

- 2026 Opening Year without Development;

- 2026 Opening Year with Development;
- 2036 Future Year without Development; and,
- 2036 Future Year with Development.

10.41. Committed developments have been included within the scenarios and are detailed within the Transport Assessment (Chapter 8) (TA).

10.42. The Design Manual for Roads and Bridges (DMRB) assessment methodology recommends that the magnitude of noise changes from a project should be classified into levels of impact. LA111 considers how the magnitude of change can be affected by whether a noise level change occurs in the short term (e.g. as a result of a sudden opening of a scheme), or in the long term (e.g. gradually over time, such as that associated with natural traffic growth).

10.43. DMRB details a methodology for assessing and managing the noise and vibration effects associated with the construction, improvement, use and maintenance of all major trunk roads. Although not strictly relevant to the Proposed Development, the principles of the guidance have been adopted as a basis for the assessment in the absence of any other, specific guidance. It is worth noting that the guidance also aligns with the IEMA Guidelines.

10.44. The Basic Noise Level (BNL), as referenced in Calculation Road Traffic Noise (CRTN)[12], will be calculated for the study area, to predict the change in noise level between 2026 opening year including committed developments without the development, and 2026 opening year including committed developments with the development. Calculations will also be undertaken to predict the change in noise level between the future year 2036 including committed developments with the development, and 2026 opening year including committed developments without the development.

10.45. In line with the relevant impact tables from DMRB, the magnitude of impact is assessed against the criteria found in Tables 10.10 and 10.11 below.

Table 10.10: Magnitude of noise impacts in the short term

Short term noise change (dB $L_{A10,18hr}$ or L_{night})	Magnitude of impact
≥5	High
3 to 4.9	Medium
1 to 2.9	Low
<1	Very Low

[12] Department for Transport/Welsh Office (1998), Calculation of Road Traffic Noise (CRTN)

Table 10.11: Magnitude of noise impacts in the long term

Long term noise change (dB $L_{A10,18hr}$ or L_{night})	Magnitude of impact
≥10	High
5 to 9.9	Medium
3 to 4.9	Low
<3	Very Low

A47 link road

10.46. In addition to the methodology and criteria described above, the significance of noise from road traffic will also draw upon the criteria in Table 10.9 and the absolute noise levels associated with the link road. The criteria set for the absolute noise levels is detailed below in Table 10.10, and is the free-field level at the façade. A noise level of 50dB $L_{Aeq,T}$ at the façade would provide an internal noise level of 35dB $L_{Aeq,T}$, assuming 15dB through a partially opened window, in accordance with BS 8233. The following impact has been defined based on the recommended internal noise levels within BS 8233.

Table 10.12: Magnitude of noise impact from the A47 link road

Daytime noise level	Magnitude of impact
≥55	High
50.1 – 54.9	Medium
45– 50	Low
<45	Very low

Assessment of tranquillity

10.47. A methodology has been devised for undertaking a tranquillity assessment in relation to the Proposed Development.

10.48. There are a number of existing methods which have been developed for assessing tranquillity, however it is still a topic of much discussion and research. Therefore, there is no standard approach which has been adopted, and any assessment method is open to interpretation and can be defined on a case-by-case basis.

10.49. Sharps Redmore have recently published literature titled 'Tranquil Spaces – Measuring the tranquillity of public spaces'[13]. Amongst others, this details two methods for assessing tranquillity, the 'University of Bradford Method' and 'The Campaign to Protect Rural

[13] Tranquil Spaces - Measuring the tranquility of public spaces, Sharps Redmore Press, 2019

England Method'.

10.50. The Bradford Method considers two factors; road traffic noise level and visual appearance. There are a number of limitations associated with the method, including the exclusion of noise sources other than road traffic.

10.51. The Campaign to Protect Rural England (CPRE) have previously produced a tranquillity map, although it is worth noting that this has since been withdrawn. A tranquillity score is derived taking into account different features which can be heard and/or seen, with each one being weighted differently. Although this method is considered to be more robust than the Bradford Method, it is not without limitations. The main one being that the tranquillity score is assigned to a 500m by 500m area, over which the noise levels can vary significantly. Therefore, this method is not considered to be suitable for the purposes of assessing the tranquillity of the Proposed Development site as the resolution is too low.

10.52. The Natural Tranquillity Method is a new methodology proposed within Tranquil Spaces – Measuring the tranquillity of public spaces. It is based on a number of parameters which are used to predict tranquillity, and although early results are promising, it is acknowledged within the text that further research is required to account for the character of man-made sounds, which can potentially skew the results due to the subjectivity of the method. Therefore, this method has not been adopted for this assessment.

10.53. Based on the fact that there is no accepted method, an assessment will be undertaken to determine the change in noise level as a result of the Proposed Development to determine the level of impact. The assessment will take into account the existing ambient noise levels measured in the vicinity of the site, in accordance with NTT2814 – Hinckley Survey Method Statement_Issue_P02. The noise levels associated with the Proposed Development will be calculated at the receptors shown in Figure 10.1 and added to the ambient noise levels measured in the vicinity of these areas to predict the change in overall noise level. It is acknowledged that other considerations such as visual aspects, can also impact tranquillity and this will be considered within the ES.

10.54. To determine the impact, the change in the absolute noise level will be determined as a result of operational noise levels associated with the Proposed Development, including development generated road traffic which includes road traffic movements once the development is operational. The adopted criteria is shown below in Table 10.13.

Table 10.13: Impact from change in sound levels

Sound level change dB $L_{Aeq,T}$ T = either 16hr day or 8hr night	Magnitude of impact
≥ 10dB	High
≥ 5.0dB and < 10dB	Medium
≥ 3.0dB and < 5dB	Low
≥ 0dB and < 3dB	Very Low

Assessment inputs

10.55. For the construction phase, source noise data has been taken from BS 5228 Annex C which details current sound level data on site equipment and site activities, and BWB source data where data was not available within BS 5228.

10.56. For the operational phase source inputs, data has been taken from the following sources:

- BWB Consulting archive noise data for HGV passbys, dock leveller and level loading processes, tug passbys and tug activity.
- Noise and vibration impact assessment undertaken to support the DCO application for the Northampton Gateway Rail Freight Interchange, particularly Appendix 8.5 – Summary of assumptions for SRFI operational activities[14]. The application was consented in October 2019 by the SoS, and therefore it is considered that the assumptions made were robust. The document can be found in Appendix 10.3.
- Noise data for reach stackers, rubber tracked gantry cranes and Class 66 trains were taken from the Proof of Evidence of Simon Stephenson on Noise[15]. The author has extensive experience in the assessment of noise from port and freight handling developments. The document can be found in Appendix 10.4.
- To establish the existing baseline regarding rail movements on the existing line, Realtimetrains[16] has been used to determine the existing number of movements of both passenger and freight trains.
- The noise levels from existing and proposed noise levels associated with the rail line have been calculated based on source levels detailed within CRN.
- The existing baseline noise environment has been characterised based on the results of a baseline noise survey undertaken by Hydrock in 2018.
- Traffic data for the Proposed Development has been provided by BWB Consulting Ltd and the methodology is detailed in Chapter 8.

10.57. Further detail is provided within this PEIR.

Identifying sensitive receptors

10.58. The nearest NSRs to the Main HNRFI Site are located in all directions from the Main HNRFI Site and are detailed below in Table 10.14 and shown in Figure 10.1. NSRs to be included within the study area have been defined in accordance with the details in paragraphs 9.7

[14] Appendix 8.5 Summary of Assumptions for SRFI Operational Activities
[15] Proof of Evidence of Simon Stephenson on Noise, Daw Mill Colliery, Tamworth Road, Arley (PINS ref no: APP/R3705/W/16/3149827, RPS Report No. JAT8968-REPT-01-R0) 26th December 2017
[16] https://www.realtimetrains.co.uk/

and 9.8. There may be other NSRs located further away from those identified below, however it is considered that these are likely to experience the most adverse effects.

Table 10.14: Identified noise sensitive receptors

NSR Number	Address	Bearing from site	Distance to Main HNRFI Site boundary (Approx..)
1	Bridge Farm	Within site boundary	N/A
2	27 Bridle Path Road, Elmesthorpe, Leicester LE9 7SA	North	400m
3	Bridle Path Road, Elmesthorpe, Leicester LE9 7SA	North	430m
4	Bridle Path Road, Elmesthorpe, Leicester LE9 7SA	North	380m
5	Billington Farm, Billington Road East	North	350m
6	Billington Road East	North	330m
7	Billington Road East	North	270m
8	Billington Road East	North	210m
9	Woodfield Stables, Burbage Common Road	East	Adjacent
10	Langton Farm, Burbage Common Road, Leicester LE9 7SE	North	Adjacent
11	Burbage Common Road, Leicester LE9 7SE	North	300m
12	Highgate Lodge Farm, Station Road, Stoney Stanton, Leicester LE9 4LU	East	500m
13	Red Hill Farm, Hinckley Road, Sapcote, Leicester LE9 4LT	East	330m
14	Averley House Farm, Hinckley Road, Sapcote, Leicester LE9 4LH	South East	140m
15	Aston Firs Caravan Park, Smithy Lane, Sapcote, Leicester LE9 4LH	South	160m
16	Castlewood Park, Aston Firs, Smithy Lane, Leicester LE9 4JZ	South	300m
17	Rosevale Park, Smithy Lane, Leicester LE9 4JZ	South	230m
18	Aston Firs SSSI	South	Adjacent
19	Burbage Common and Woods	South and west	Adjacent

NSR Number	Address	Bearing from site	Distance to Main HNRFI Site boundary (Approx..)
20	Basset Cottage, Burbage Common, Hinckley LE10 3DD	North west	Adjacent
21	Hissar House Farm, Leicester Road,	North	140m
22	Church View Fields Farm, Leicester Road,	North	210m
23	Proposed Crematorium (18/00751/DEEM), land east of Leicester Road, Hinckley LE10 3PR	North	390m
24	Billington Rough Dwelling	North	50m
25	Billington Road East	North East	180m
26	Billington Road East	North East	100m

Receptor sensitivity

10.59. In accordance with the principles of EIA, the sensitivity of receptors to noise or vibration impacts during either construction or operational phases are defined in Table 10.15.

Table 10.15: Sensitivity/Value of receptor

Sensitivity/Value of resource/receptor	Description	Example of receptor usage
Very High	Receptors where noise or vibration will significantly affect the function of a receptor	Auditoria/studios and specialist medical/teaching centres, or laboratories with highly sensitive equipment
High	Receptors where people or operations are particularly susceptible to noise or vibration. Sensitive ecological receptors known to be vulnerable to the effects of noise or vibration.	Residential; Quiet outdoor areas used for recreation; Conference facilities; Schools/educational facilities in the daytime; Hospitals/residential care homes; Libraries; and Ecologically sensitive areas for example Special Protection Areas (SPAs)
Medium	Receptors moderately sensitivity to or vibration where it may cause some distraction or disturbance	Offices; Restaurants; and Sports grounds when spectator or noise is not a normal part of the event and where quiet conditions are necessary (e.g. tennis, golf).
Low	Receptors where distraction or disturbance of people from noise or vibration is minimal	Residences and other buildings not occupied during working hours; Factories and working environments with existing high noise levels; and Sports grounds when spectator or noise is a normal part of the event.

Characterisation of effect

Significance of effects

10.60. The significance of effect resulting from each individual potential impact type above is derived from the characterisation of the effect, the magnitude of the impact and the sensitivity or value of the affected receptor using the matrix presented in Table 10.16 below.

Table 10.16: Classification of effects

Sensitivity/Value of resource/receptor	Magnitude of impact			
	High	Medium	Low	Very low
Very high	Major	Major	Moderate	Minor
High	Major	Moderate	Minor	Negligible
Medium	Moderate	Minor	Negligible	Negligible
Low	Minor	Negligible	Negligible	Negligible

10.61. With respect to the Classification of Effects outcomes from Table 10.16, effects of negligible and minor are considered to be insignificant, whereas effects of moderate and major are considered to be significant, in EIA terms.

Significance criteria

10.62. The following terminology will be used in the assessment to define effects:

- adverse – detrimental or negative effects to an environmental resource or receptor;
- negligible – imperceptible effects to an environmental resource or receptor; or
- beneficial – advantageous or positive effect to an environmental resource or receptor.

10.63. Where adverse or beneficial effects are identified, these will be assessed against the following significance scale:

- minor – slight, very short or highly localised effect of no significant consequence;
- moderate – limited effect (by extent, duration or magnitude), which may be considered significant; or
- major – considerable effect (by extent, duration or magnitude) of more than local significance or in breach of recognised acceptability, legislation, policy or standards.

10.64. Effects can also be characterised as temporary or permanent and either short-term, medium term or long-term depending on the duration of the effect. Short-term effects are defined as temporary effects related to a specific construction event of no more than a year's duration. Medium term effects are defined as temporary effects of a longer duration, such as those arising over an extended period of construction, ranging from one year to the full construction period. Long-term effects are defined as permanent effects arising from the operation of the HNRFI.

Construction phase

10.65. Any impacts associated with the construction of the Proposed Development are likely to be short or medium term and temporary in nature. The significance of any impacts are identified in accordance with relevant guidance.

Operational phase

10.66. Any impacts associated with the operational phase of the Proposed Development are likely to be long term in nature. The impact of the Proposed Development is determined with regard to the change in existing noise levels at nearest NSRs to the Proposed Development.

Assumptions and limitations

10.67. At this stage , there is inherently a degree of uncertainty over the final layout of the site, including where primary noise sources are to be located. Therefore, reasonable assumptions based on the parameters plan and illustrative masterplan will be made.

10.68. Furthermore, final selection of fixed plant and equipment is not currently known, as is usual for this stage. This will be dealt with in the following sections.

10.69. The initial modelling and assessment work has not accounted for the proposed earthworks as these were unknown at the time. The proposed earthworks have been used to inform the mitigation strategy for the scheme from an acoustics perspective.

10.70. The assumptions and limitations associated with the traffic data are detailed within Chapter 8.

10.71. Trip generation data for the site during the operational phase is highly robust and have been ratified by the Transport Working Group (TWG). The TWG are representatives of the major highway and planning authorities and meet on a regular basis to discuss transport and highways input to the DCO. These have been forecast from existing distribution sites in the Midlands for HGVs. Car trips have been based on a worst case from Swan Valley, which is a distribution centre that has limited public transport access and is heavily car dependent. Further detail can be found in Chapter 8.

RELEVANT LAW, POLICY AND GUIDANCE

10.72. In considering a Nationally Significant Infrastructure Project (NSIP), the Planning Inspectorate (PINS) is guided by the National Policy Statement for National Networks[17] and by other material considerations.

10.73. A full description of relevant policy, standards and guidance in provided in Appendix 10.2

[17] National Policy Statement for National Networks (2014)

and includes the following documents.

National Planning Policy

- National Policy Statement (NPS) for National Networks;
- National Planning Policy Framework (NPPF)[18];
- Noise Policy Statement for England (NPSE)[19]; and
- National Planning Practice Guidance (NPPG)[20].

Local Planning Policy

- Blaby District Local Plan and Core Strategy[21];
  - Blaby Green Space Strategy[22];
  - Local Plan (Delivery) Development Plan Document[23];
- Blaby Landscape and Settlement Character Assessment[24];
- Planning Guidance Note – Noise[25];
- Hinckley and Bosworth Borough Council Site Allocations and Development Management Policies[26];
- Rugby Local Plan[27]; and
- Harborough Local Plan[28].

Other Relevant Policy, Standards and Guidance

- British Standard 7445-1:2003 Description and measurement of environmental noise: Guide to quantities and procedures[29];

[18] Communities and Local Government (2021), National Planning Policy Framework
[19] Department for Environment, Food and Rural Affairs (2010); Noise Policy Statement for England (NPSE)
[20] Ministry of Housing, Communities and Local Government (MHCLG) (2014), Planning Practice Guidance
[21] Blaby District Council (2013) Adopted Core Strategy
[22] Blaby Green Space Strategy 2012
[23] Blaby District Council Local Plan (Delivery) Development Plan Document, February 2019
[24] Blaby Landscape and Settlement Character Assessment, Final report January 2020
[25] Planning Guidance Note – Noise 2019
[26] Hinckley and Bosworth Borough Council Site Allocations and Development Management Policies DPD, July 2016
[27] Rugby Borough Council (2019) Rugby Borough Council Local Plan 2011-2031
[28] Harborough District Council (2019) Harborough Local Plan 2011-2031
[29] British Standard 7445-1:2003 Description and measurement of environmental noise: Guide to quantities and procedures

- British Standard 5228:2009+A1:2014 Code of practice for noise and vibration control on construction and open sites parts 1:Noise (BS 5228);
- British Standard 5228:2009+A1:2014 Code of practice for noise and vibration control on construction and open sites parts 2:Vibration (BS 5228);
- WHO Guidelines for community noise;
- WHO Environmental Noise Guidelines for the European Region;
- British Standard 8233:2014 Guidance on sound insulation and noise reduction for buildings (BS 8233)[30];
- British Standard 4142:2014+A1:2019 Method for rating and assessing industrial and commercial sound (BS 4142);
- IEMA Guidelines for environmental noise impact assessment;
- Highways England (2019) Design Manual for Roads and Bridges (DMRB) LA 111 Noise and vibration Revision 2;
- Calculation of road traffic noise (CRTN);
- Calculation of rail noise (CRN);
- DEFRA Additional railway noise source terms for Calculation of Railway Noise[31];
- British Standard 6472-1:2008 Guide to evaluation of human exposure to vibration in buildings; and,
- Public Health England – Noise and Health[32]

BASELINE CONDITIONS

Site context

10.74. The Proposed Development site currently comprises open agricultural land and is located to the north-east of Hinckley.

10.75. The Proposed Development is predominately agricultural land. To the north of the site lies the Leicester to Hinckley railway with the villages of Elmesthorpe and Earl Shilton beyond. To the south of the Main HNRFI Site lies the M69 Motorway with the villages of Sapcote and Stoney Stanton to the east . To the west of the Main HNRFI Site lies Burbage

[30] British Standards Institute (2014), BS8233 Guidance on noise insulation and noise reduction for buildings
[31] Additional railway noise source terms for Calculation of Railway Noise 1995
[32] Public Health England – Noise and Health

Wood, Aston Firs and Freeholt Wood with Hinckley beyond. Agricultural uses predominate the land to the east of the site.

Baseline noise and vibration survey

10.76. A baseline noise and vibration assessment has previously been undertaken by Hydrock. Noise monitoring was undertaken between 24th July 2018 and 1st August 2018 at four locations considered representative of NSRs in the vicinity of the site. Measurement locations adopted during the survey are identified in Figure 10.2 and are described in Appendix 10.3.

10.77. Vibration monitoring was undertaken at one location adjacent to the existing rail line. However, further monitoring is required to undertake a detailed assessment, which will be completed and reported on within the ES. Therefore, the results of the previous vibration monitoring have not been reported within the PEIR document, as they have not been utilised within the following assessment. A qualitative assessment has been undertaken on vibration as a result of Proposed Development and is detailed within paragraphs 10.156 to 10.159.

Measurement results

10.78. The results are shown below in Tables 10.17, 10.18, 10.19 and 10.20.

Table 10.17: Summary of measured sound pressure levels at ML1

Day and date	Measured noise levels, dB re, 2 x 10^{-5} Pa							
	Daytime (0700 – 2300)				Night-time (2300 – 0700)			
	$L_{Amax,f}$[1]	$L_{A10,15m}$[2]	$L_{Aeq,15m}$[3]	$L_{A90,15m}$[4]	$L_{Amax,f}$[1]	$L_{A10,15m}$[2]	$L_{Aeq,15m}$[3]	$L_{A90,15m}$[4]
Tuesday 24th July 2018	71	50	49	44	71	51	49	44
Wednesday 25th July 2018	80	52	52	47	71	54	53	45
Thursday 26th July 2018	66	54	53	50	72	49	48	42
Friday 27th July 2018	75	51	50	47	62	50	48	44
Saturday 28th July 2018	84	54	53	51	66	50	49	44
Sunday 29th July 2018	68	56	55	52	63	51	51	45
Monday 30th July 2018	76	54	53	51	65	48	47	42
Tuesday 31st July 2018	79	52	51	48	66	49	48	40

[1] *Highest L_{Afmax} sound pressure level during measurement period*
[2] *Arithmetic average of the measured 15min periods*
[3] *Logarithmic average sound pressure levels during measurement period*
[4] *Representative $L_{A90,15m}$ value to be used following statistical analysis of $L_{A90,15m}$, including max, min, mode, median and mean*

Table 10.18: Summary of measured sound pressure levels at ML2

Day and date	Measured noise levels, dB re, 2 x 10^{-5} Pa							
	Daytime (0700 – 2300)				Night-time (2300 – 0700)			
	$L_{Amax,f}$[1]	$L_{A10,15m}$[2]	$L_{Aeq,15m}$[3]	$L_{A90,15m}$[4]	$L_{Amax,f}$[1]	$L_{A10,15m}$[2]	$L_{Aeq,15m}$[3]	$L_{A90,15m}$[4]
Tuesday 24th July 2018	80	43	51	34	81	42	53	32
Wednesday 25th July 2018	80	43	51	35	79	43	52	36
Thursday 26th July 2018	78	45	49	39	81	41	52	32
Friday 27th July 2018	77	43	49	37	78	40	46	34
Saturday 28th July 2018	79	49	51	43	72	40	42	36
Sunday 29th July 2018	76	46	48	42	71	40	41	34
Monday 30th July 2018	76	44	49	39	80	40	48	31
Tuesday 31st July 2018	88	45	50	37	77	38	47	30

[1] *Highest L_{Afmax} sound pressure level during measurement period*
[2] *Arithmetic average of the measured 15min periods*
[3] *Logarithmic average sound pressure levels during measurement period*
[4] *Representative $L_{A90,15m}$ value to be used following statistical analysis of $L_{A90,15m}$, including max, min, mode, median and mean*

Table 10.19: Summary of measured sound pressure levels at ML3

Day and date	Measured noise levels, dB re, 2 x 10^{-5} Pa							
	Daytime (0700 – 2300)				Night-time (2300 – 0700)			
	$L_{Amax,f}$[1]	$L_{A10,15m}$[2]	$L_{Aeq,15m}$[3]	$L_{A90,15m}$[4]	$L_{Amax,f}$[1]	$L_{A10,15m}$[2]	$L_{Aeq,15m}$[3]	$L_{A90,15m}$[4]
Tuesday 24th July 2018	96	46	64	34	97	43	65	33
Wednesday 25th July 2018	96	47	64	35	96	45	65	38
Thursday 26th July 2018	96	47	63	39	98	42	66	34
Friday 27th July 2018	95	45	63	37	92	42	58	36
Saturday 28th July 2018	95	50	62	43	89	43	53	38
Sunday 29th July 2018	95	49	59	43	90	42	50	38
Monday 30th July 2018	98	47	61	41	97	41	61	33
Tuesday 31st July 2018	96	47	62	38	95	41	60	33

[1] *Highest L_{Afmax} sound pressure level during measurement period*
[2] *Arithmetic average of the measured 15min periods*
[3] *Logarithmic average sound pressure levels during measurement period*
[4] *Representative $L_{A90,15m}$ value to be used following statistical analysis of $L_{A90,15m}$, including max, min, mode, median and mean*

Table 10.20: Summary of measured sound pressure levels at ML4

Day and date	Measured noise levels, dB re, 2 x 10^{-5} Pa							
	Daytime (0700 – 2300)				Night-time (2300 – 0700)			
	$L_{Amax,f}$[1]	$L_{A10,15m}$[2]	$L_{Aeq,15m}$[3]	$L_{A90,15m}$[4]	$L_{Amax,f}$[1]	$L_{A10,15m}$[2]	$L_{Aeq,15m}$[3]	$L_{A90,15m}$[4]
Tuesday 24th July 2018	82	45	47	38	71	47	47	39
Wednesday 25th July 2018	80	49	49	41	80	52	50	43
Thursday 26th July 2018	71	51	50	46	71	48	47	41
Friday 27th July 2018	83	49	49	44	68	48	47	41
Saturday 28th July 2018	89	55	54	50	64	49	46	42
Sunday 29th July 2018	72	53	52	50	69	50	50	44
Monday 30th July 2018	95	53	52	48	75	48	46	41
Tuesday 31st July 2018	79	50	49	45	70	49	49	40

[1] Highest L_{Afmax} sound pressure level during measurement period
[2] Arithmetic average of the measured 15min periods
[3] Logarithmic average sound pressure levels during measurement period
[4] Representative $L_{A90,15m}$ value to be used following statistical analysis of $L_{A90,15m}$, including max, min, mode, median and mean

10.79. The weather conditions during the noise survey have been provided by Hydrock, and these are reproduced below in Table 10.21.

Table 10.21: Summary of weather conditions during noise survey

Date	Temperature (°C)			Humidity (%)		Wind speed (ms^{-1})			Precipitation (mm)
	Avg.	Min.	Max.	Min.	Max.	Avg.	Max.	Direction	Total
24/07/ 2018	22	18	26	47	83	3.2	10.7	SE	0.0
25/07/ 2018	20	15	26	34	77	2.0	5.8	W	0.0
26/07/ 2018	23	16	31	38	82	3.1	11.6	SE	0.0
27/07/ 2018	21	16	27	39	88	3.1	11.6	SSE	0.0
28/07/ 2018	17	13	20	45	94	5.0	12.5	SW	0.0
29/07/ 2018	17	14	19	82	100	5.5	15.6	S	0.0
30/07/ 2018	17	13	22	56	100	3.3	9.8	S	0.0
31/07/ 2018	17	13	22	43	100	2.9	8.0	SW	0.0
01/08/ 2018	17	12	23	44	94	2.9	7.6	SW	0.0

Future baseline

10.80. The noise levels across the Main HNRFI Site are dominated by noise from road traffic on the surrounding road network. For the noise levels to increase by 3dB, which is widely accepted to be just perceptible, there would need to be a doubling of the existing flows. A review has been undertaken of the traffic data provided by the Transport Consultant, which indicates that there will be up to a 4dB increase on the B4669 and slip roads associated with the M69, and up to a 6dB increase at the roundabout associated with junction 2 of the M69. However, the lower, measured background noise levels have been used as a basis for the following assessment to provide a worst-case scenario.

Sensitivity of receptors

10.81. In accordance with the criteria detailed in Table 10.15, the sensitivity of all of the identified existing sensitive receptors from Table 10.14 will be identified as high.

POTENTIAL SIGNIFICANT ENVIRONMENTAL EFFECTS OF THE PROPOSALS

Construction phase

10.82. This section discusses the potential noise and vibration effects on sensitive receptors arising during the construction phase of the Proposed Development.

10.83. Noise and vibration levels experienced by local receptors during such works depend upon a number of variables, the most significant of which are:

- the noise generated by plant or equipment used on site, generally expressed as sound power levels (L_w) or the vibration generated by the plathethe periods of use of the

plant on site, known as onthee;

- the distance between the noise/vibration source and ththeceptor;
- the noise attenuation due to ground absorption, air absorption and barrier effects;
- in some instances, the reflection of noise due to the presence of hard surfaces such as the sides oftheldings; and
- the nature of the ground with respect to vibration transmission.

10.84. Key construction related activities associated with the Proposed Development are likely to include, but are not limited to:

- excavation and substructure works (including piling, although the need for this and locations are not yet known);
- drainage works;
- superstructure and building envelopes;
- fitting out; and
- hard landscaping/highways infrastructure.

Construction noise

10.85. Specific details of activities and associated plant are not available at this stage. In terms of the potential noise effects, excavation/earthworks/regrading using heavy plant is likely to be the source of the main impacts at nearby NSRs. The construction and fitting out of the new buildings are likely to result in lower noise levels.

10.86. Notwithstanding this, Table 10.22 sets out the key construction activities which have been assumed including the plant type, number and assumed utilisation (percentage 'on-time') used in the prediction of noise levels. These were taken from BS 5228 Annex C which details current sound level data on site equipment and site activities, and BWB source data where data was not available in BS 5228.

Table 10.22: Assumed construction plant details

Element	Construction phase/activity	Plant type (BS 5228 ref data)	Sound pressure level dB at 10m	Number of plant	Assumed percentage 'on-time'
1	Site preparation works including demolition,	Tracked Excavator [C2.19]	77	10	50

Element	Construction phase/activity	Plant type (BS 5228 ref data)	Sound pressure level dB at 10m	Number of plant	Assumed percentage 'on-time'
	earthworks	Wheeled Loader [C2.28]	76	10	50
		Dump Truck [C2.30]	79	15	50
		Diesel Generator [C4.79]	64	3	100
2	Foundation works involving concreting plant, trucks and lorries	Poker Vibrator [C4.33]	78	4	75
		Concrete pump and a cement mixer truck [C4.24]	67	4	50
		Concrete mixer truck [C4.18]	75	10	75
		Tracked excavators [C2.19]	77	3	50
		Dump truck [C2.30]	79	2	50
		Vibratory Plate [C2.41]	80	4	50
		Vibro-displacement rig [C3.27]	80	4	75
		Lorry Arriving [BMB source data]	66	1	25
3	Building erection works involving lorries, tracked cranes and hand-held tools	Lorry Arriving [BMB source data]	66	8	25
		Dump truck [C2.30]	79	2	50
		Diesel Generator [C4.79]	64	2	100

Element	Construction phase/activity	Plant type (BS 5228 ref data)	Sound pressure level dB at 10m	Number of plant	Assumed percentage 'on-time'
		Mobile telescopic crane [C4.45]	82	2	50
		Tracked excavators [C2.19]	77	7	50
		Hand-held nail gun [C4.95]	73	10	10
		Compressor for mini piling [C3.19]	75	4	80
4	Road surfacing including asphalt paving equipment and lorries	Asphalt paver and tipping lorry [C5.30]	75	2	100
		HGV pass-by	66	2	100

10.87. The likely noise effects were predicted at the NSRs located closest to the site boundaries, as it is assumed that the impact will be less for those receptors located further away. These predictions were undertaken based upon assumed construction methodologies, including the types and numbers of proposed plant. The predictions have followed the methodology contained within BS 5228 Part 1 and are in terms of the $L_{Aeq,T}$ over the core working day. The assessment considered both an 'average' case scenario and a 'worst-case' scenario, which take the form of the following:

- average case scenario – Construction plant operating in the approximate centre point of the closest area of construction to each NSR; and
- worst-case scenario – Construction plant operating at the closest point to a given NSR.

10.88. Predictions were carried out to determine noise levels likely to be generated by each of the above activities. For the purpose of these predictions, the intervening ground between the construction noise sources and the receivers is considered to be acoustically soft and that there will be no additional attenuation of sound due to acoustic barriers or screening such as local buildings. It has also been assumed that no construction activities will be undertaken on Burbage Common Road, between the Main HNRFI Site and the B581.

10.89. For NSRs which are adjacent or within the red line boundary, it has been assumed that construction activities could take place at a minimum of 25m from the NSR for the worst-

case scenario. For the average case scenarios, it has been assumed that the site preparation and foundation works could be associated with the proposed roads, where these elements are closest to the NSRs. For NSRs that cover a large area, such as NSRs 15 to 19, the area closest to each phase of the construction area has been considered. The location of NSRs are shown on Figure 10.1.

10.90. Table 10.23 sets out the predicted unmitigated construction noise levels at a selection of the nearest NSRs, for the average and worst-case situations as described above. In accordance with BS 5228, caution needs to be given when calculating noise levels at distances greater than 300m, due to the increasing effects of meteorological conditions. Therefore, receptors which are located at a greater distance than 300m from the site boundary have not been included within the following assessment.

10.91. The assessment criterion was adopted in accordance with the ABC method as detailed in BS 5228, based on the daytime measured noise levels as detailed in Tables 10.17 to 10.20. The measured ambient noise levels are below 65dB at all locations, when rounded to the nearest 5dB. Where measured data is not available, the lower criterion of 65dB has been applied. The highlighted cells show the NSRs where the 65dB criterion is predicted to be exceeded due to construction noise.

Table 10.23: Predicted unmitigated average/worst-case construction phase noise levels

NSR	Phase of construction works							
	Average case[1] (dB $L_{Aeq,T}$)				Worst-case(dB $L_{Aeq,T}$)			
	1	2	3	4	1	2	3	4
1	66	65	*	51	83	82	79	66
9	*	*	*	43	83	82	79	66
10	58	57	55	*	83	82	79	66
14	*	*	*	*	71	71	68	56
15	75	74	53	60	83	82	79	66
16	62	62	*	48	83	82	79	66
17	59	59	*	45	83	82	79	66
18	58	58	*	45	83	82	79	66
19	73	72	*	58	83	82	79	66
20	57	56	*	43	83	82	79	66
21	62	61	*	48	71	71	68	56
22	57	57	*	44	64	64	61	50
24	65	64	*	*	83	82	79	66
26	62	62	*	47	67	67	64	53

**Where construction activities are predicted to be undertaken at a distance greater than 300m, the results are not reported. However, at distances greater than 300m, the noise levels are likely to be below the lower criteria of 65dB.*

10.92. For works outside the daytime hours of 8am – 6pm as considered in BS 5228-1, additional limit values should be agreed with BDC and HBBC. As a conservative approach, based on the lower threshold limit being applied for the main daytime works, the interim Saturday morning limit value and the evening (after 7pm) and Sunday/Bank Holiday value could both be a lower limit of 55 dB L_{Aeq}.

10.93. The unmitigated effect of construction noise is likely to be a temporary, major adverse at worst for NSRs, based on construction taking place close to NSRs. However, for the majority of receptors, for the average case scenarios, the noise levels are predicted to be below the criterion of 65dB, resulting in a temporary, minor adverse effect. For NSRs 1, there is predicted to be slight exceedance of the criterion resulting in a temporary, moderate adverse impact. For NSRs 15 and 19, there is likely to be a temporary, major adverse effect, based on the element of the construction works taking place.

10.94. However, the above assessment is based on both an average and worst-case scenario and does not take in account any screening afforded by onsite buildings or any mitigation. It is likely that the effect would be lower than this, and any major adverse effect would be short-term.

10.95. It is acknowledged that the construction phase is likely to be undertaken over a period of up to 10 years. However, it is considered unlikely that construction would take place close to receptors over a prolonged period of time. For the average case scenario, exceedances are predicted for elements 1 and 2, which relate to ground preparation. It is unlikely that these elements would take place for a significant amount of time without some screening being afforded by other phases of the Proposed Development as it is built out.

10.96. Based upon the above, recommendations for appropriate mitigation are presented in the mitigation measures section below.

10.97. At this stage of the PEIR, the construction programme for the HNRFI Site has been set out in an indicative programme in Chapter 3. More detail on construction traffic movements will be included for the final submission, including details of material removal, construction traffic management and environmental management. Further detail on this information will be included in the Construction Environmental Management Plan (CEMP).

Construction vibration

10.98. In order to determine the potential impact from vibration during the construction phase, groundborne vibration calculations were performed for typical site preparation/construction activities/machinery based on the empirical prediction procedures presented within BS 5228-2:2009 and Transport Research Laboratory RR 246 Traffic induced vibrations in buildings[33] (applicable to HGV induced vibration).

10.99. Such predictions were performed in order to determine the possible distances at which the adopted magnitude of effect criteria may be registered. In this regard, the following groundborne vibration levels and associated distances were identified for a sample of

[33] Transport Research Laboratory RR 246 Traffic induced vibrations in buildings

typical construction vibration sources.

10.100. It should be noted that there may be a variety of different potential vibration generating activities employed during construction phase other than those presented below, although it is considered that those presented represent some of the worst that could be encountered. The data presented within Table 10.24 are general in nature and not specific to any one site; however, the vibration levels and associated distances can be used to determine the typical distances at which specific impacts may be registered.

Table 10.24: Predicted ground-borne vibration levels applicable to typical vibration generating site preparation/construction activities

Operation	Distance (m)	Peak Particle Velocity (PPV) (mm/s)
Rotary bored piling – auger hitting base	45	0.3
	14	1.0
	1.4	10
Rotary bored piling – driving case	75	0.3
	23	1.0
	2.3	10
HGVs[1]	50	0.3[2]
	17	1.0[2]
	2.5	10[2]

[1] Assume max height/depth of surface defect of 50mm, max speed of 30km/h, and that surface defect occurs at both wheels.
[2] Where alluvium soils are present, higher vibration levels can be expected.

10.101. Based on a worst case receptor distance of 25m from any proposed works, the impact magnitude of potential vibration effects can be determined. The above activities are likely to result in a temporary minor, adverse effect, at the majority of NSRs, which would result in vibration levels between 0.3mm/s and 1.0mm/s. For NSRs 1, 9, 10, 15 through 19 and 24, which are located either within or adjacent to the Main HNRFI Site, there is the potential for a temporary, moderate adverse effects to be experienced should proposed works be undertaken at distances closer than 25m. However, should any vibration generating works be undertaken close to the Main HNRFI Site boundary, any effect would be short-term and temporary in nature.

10.102. Given the likely setback distances and techniques, it is likely that any effect would be limited to a temporary, negligible adverse effect for the majority of the NSRs, which would result in vibration levels less than 0.3mm/s. Outline recommendations are provided in order to minimise the effects of vibration upon existing nearby NSRs.

Completed development

10.103. The Proposed Development has the potential to impact on nearby NSRs. The assessment has considered the following:

- noise from HGV movements, loading/unloading operations, lorry park and service yard areas, including SRFI operations;
- noise from fixed plant and equipment on the Proposed Development, including the proposed energy centre;
- noise from proposed off-site rail movements;
- vibration from off-site rail movements;
- noise from road traffic once the development is operational;
- noise from the proposed A47 link road; and
- The effect of operational noise on local tranquility.

Noise model

10.104. To assess the potential noise impacts from noise associated with the operational phase of the SRFI on NSRs, a noise model has been created using CadnaA© noise modelling software to establish the potential future noise levels from proposed operations.

10.105. The noise model was generated applying the following methodology:

- For industrial/commercial noise sources, the noise model was set to apply the noise prediction methodology set out in ISO 9613-2: Acoustics – Attenuation of sound during propagation outdoors – Part 2: General method of calculation[34].
- Mapping of the Site and the surrounding area was calibrated into the noise model based on known Ordinance Survey grid reference points.
- Indicative ground topography was approximated using Lidar data at 1m.
- Off-site buildings which would provide screening to the Site have been incorporated as reflective façades.
- To reflect the local ground cover with the Proposed Development in place, ground absorption was set to G = 0.5 (50% acoustically absorptive ground). The absorption was set to 1.0 (100% acoustically absorptive ground) for the area between the Proposed Development and receptors to the north.

[34] ISO 9613-2: Acoustics – Attenuation of sound during propagation outdoors – Part 2: General method of calculation

- The model was set to include second order reflected noise from solid structures.
- An illustrative layout has been incorporated into the noise model in order to account for screening that is provided by the development itself.
- Proposed buildings have an assumed height of 26m. It is understood that building heights could be between 27m to 33m. Although the building heights will be higher than those modelled, it is unlikely to affect the outcome of the assessment. Furthermore, using lower building heights presents a worst-case scenario as any increase in the height will increase the screening provided by the proposed buildings.

Noise from HGV movements, loading/unloading operations and service yard areas, including SRFI operations

10.106. Activities associated with HGV movements, the loading/unloading of vehicles onsite, and SRFI operations have been assessed in accordance with BS 4142.

10.107. Noise from HGV movements and deliveries were included in the model using noise data from a library of historical measurement data, which has been collected during surveys undertaken at similar developments. The masterplan indicates that units will incorporate both dock levellers and entry level doors, therefore this has been taken into account when selecting the noise data to be used within the assessment. The noise levels used within the assessment are presented in Tables 10.25, 10.25, 10.27 10.28 and 10.29.

Table 10.25: Summary of historic loading and unloading noise data used in the assessment – Dock leveller

Description	Time	L_{Aeq} at 10m (dB(A))
Daytime		
HGV arriving	2 minutes	51
Loading/unloading noise	43 minutes	54
HGV departing	1 minute	46
Total		**52 dB $L_{Aeq,1h}$**
Night-time		
HGV arriving	2 minutes	57
Loading/unloading noise	13 minutes	55
Total		**56dB $L_{Aeq,15m}$**

Table 10.26: Summary of historic loading and unloading noise data used in the assessment – Entry level door

Description	Time	L_{Aeq} at 10m (dB(A))
Daytime		
HGV Delivery including arriving/departing, impact noise and cargo being wheeled	46 minutes	58
Night-time		
HGV Delivery including arriving/departing, impact noise and cargo being wheeled	15 minutes	60

Table 10.27: Summary of historic HGV passby noise data used in the assessment

Source	Measurement Distance (m)	Measurement Duration (s)	dB $L_{Aeq,T}$	dB $L_{Af,max}$
HGV passby	5	6	73	78

Table 10.28: Summary of historic tug activity data used within the assessment

Source	Measurement Distance (m)	Measurement Duration (s)	dB $L_{Aeq,T}$	dB $L_{Af,max}$
Tug activity	7	66	76	94

Table 10.29: Summary of historic tug passby noise data used within the assessment

Source	Measurement Distance (m)	Measurement Duration (s)	dB $L_{Aeq,T}$	dB $L_{Af,max}$
Tug passby	3	10	74	82

10.108. Deliveries and HGV movements have been included in the noise model using the following:

- Noise from deliveries have been included in the model as a point source with a height of 1.5m.
- The noise from HGV and tug passbys have been included within the model as a line source with a height of 1.5m.
- For the daytime and night-time periods, the number of deliveries for each unit used

within the assessment is based on the worst-case hour provided by the Transport Consultant. There is predicted to be 522 two-way movements in a worst-case hour during the daytime, and 354 two-way movements in a worst-case hour during the night-time. The total number of movements for the night-time has been divided by four to approximate a 15-minute period. The total number of movements has been divided up between the units based on the total percentage of delivery bays associated with each unit. The bay occupancy has been assumed to be half of the two-way movements. This ensures that each movement is accounted for and provides a realistic distribution to each unit based on the number of delivery bays. The assumed number of deliveries and bay occupancy for each unit are shown below in Table 10.30 for the daytime and night-time periods.

Table 10.30: Number of assumed deliveries and bay occupancy to each unit

Unit	Daytime		Night-time	
	Assumed number of passbys per hour during the daytime	Assumed number of occupied bays per hour during the daytime	Assumed number of passbys per 15m during the night-time	Assumed number of occupied bays per 15 minutes during the night-time
1	27	13	5	2
2	24	12	4	2
3	19	9	3	2
4	21	10	4	2
5	34	17	6	3
6	24	12	4	2
7	28	14	5	2
8	28	14	5	2
9	38	19	7	3
10	89	44	15	8
11	65	32	11	5
12	118	59	20	10
Rail Terminal	7	N/A	1	N/A

- The noise levels from tug passbys have been corrected for distance to 10m and time based on the assumed number of passbys associated with each unit. These have been included in the model as a line source at a height of 1.5m.

- The number of tug passbys and associated activity has been calculated based on 50% occupancy of the parking bays associated with each unit for the daytime, and 25% for the night-time. The resultant number of movements for each unit are shown below in Table 10.31.

Table 10.31: Assumed number of tug movements

Unit	Number of movements associated with 50% bay occupancy during the daytime	Number of movements associated with 25% bay occupancy during the night-time
1	30	15
2	25	12
3	23	11
4	27	13
5	34	17
6	26	13
7	31	16
8	35	17
9	21	10
10	22	11
11	27	13
12	69	35

10.109. For HGV and tug movements, the calculations detailed in BS 5228 Part 1, for calculating sound power levels (SWL) from mobile plant and haulage routes have been used, which are reproduced in equations (a) and (b) below.

(a) SWL = LAmax@10m + 28

(b) L_{Aeq} = SWL – 33 +10log(Q) – 10log(V) – 10log (d)

Where Q is the flow (number of vehicles per hour);

V is the average spend of the vehicles in km/h, assumed to be 48km/h; and

D is the distance (m) of the receiver position, assumed to be 10m.

10.110. In the absence of specific data, the following sources have also been included within the assessment, detailed below in Table 10.32.

Table 10.32: Adopted noise emission data used in the assessment

Equipment	Sound power L_{WA} dBA	Modelled height	Assumed number of sources		Assumed % ontime
			Day	Night	
Reach stacker	109	2m	8	4	50
RTG crane engine	109	26m	2	2	50

Equipment	Sound power L_{WA} dBA	Modelled height	Assumed number of sources		Assumed % ontime
			Day	Night	
RTG crane exhaust	105	26m	2	2	50
Class 66 idling or pulling away	106	4m	10	10	10

10.111. Octave band levels for the equipment are shown below in Table 10.33. Where necessary, $L_{Aeq,T}$ noise levels have been corrected for distance to 10m and the sound pressure for each octave converted to SWLs, using the following equation.

SWL = L_{Aeq}@10m + 28

Table 10.33: Octave band sound power levels (SWLs) for sources

Source	Octave band sound power levels (L_w dB)							
	63Hz	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz	8kHz
Delivery noise- Dock leveller	99	90	85	85	86	84	83	83
Delivery noise – Entry level door	88	85	83	83	85	79	73	67
HGV passby	116	102	94	93	97	92	91	84
Tug passby	105	103	101	102	97	92	87	79
Tug activity	114	107	101	100	100	95	91	84
Reach stacker	101	104	111	107	104	97	90	81
RTG crane engine	105	113	110	106	103	100	95	90
RTG crane exhaust	109	119	109	91	84	82	76	70
Class 66 idle or pulling away	116	104	101	105	102	95	90	76

10.112. The assessment is based on the following assumptions:

- The site will operate for the whole 24-hour period.
- For the daytime, each delivery event includes the HGV arriving and leaving, and for the night-time, it is assumed that the HGV will not arrive and leave within the same 15-minute period. The number of HGV passbys is based upon the provisional data provided by the Transport Consultant, and described above.
- It has been assumed that there will be dock levellers and entry level loading bays associated with each unit. It has been assumed that entry level bays are located

towards the ends of the delivery areas of each unit.

- It has been assumed that a class 66 locomotive will be used to shunt wagons on the sidings. This has been modelled as 10-point sources spread on the proposed sidings, each with an on-time of 10% to account for the slow movement of the train.
- All the visits would be for loading/unloading purposes.
- All of the above operations happen during each of the deliveries/collections to the site, as a worst-case.

10.113. Based on the above information, the predicted daytime and night-time noise levels have been calculated at the NRSs, as identified in Table 10.11 without any mitigation in place. The noise level from operations at the Proposed Development site have been modelled in outdoor living areas at a height of 1.5m during the daytime, and at first floor facades during the night-time. For NSRs 15, 16 and 17, the night-time levels have been predicted at ground floor facades.

10.114. As NSR10 includes stables and a paddock, the daytime outdoor level has been calculated within the paddock, and for the night-time period, the specific level at the façade has been used. For NSRs that have been identified as farms, the assessment has been undertaken at the residential elements.

10.115. A penalty of 2dB has been applied to account for tonality associated with the gantry cranes which is likely to be just perceptible at NSRs 1 through 8, 19, 20, 25 and 26. A 4dB penalty has been applied at NSR24, to account for tonality which is likely to be clearly perceptible.

10.116. A penalty of 3dB has been applied to account for impulsivity associated with the Proposed Development which is likely to be just perceptible at NSRs 2 through 8, 19, 20, 25 and 26. A 6dB penalty has been applied at NSR24, to account for impulsivity which is likely to be clearly perceptible.

10.117. To account for impulsivity at NSRs 9 and 10, a penalty of 6dB and 3dB has been applied respectively.

10.118. Given the intervening distance between the Proposed Development and NSRs 12, 13 and 14, and the presence of the M69, it is considered that noise associated with HGV deliveries is unlikely to be noticeable against the existing noise climate at these NSRs. Therefore, no penalties have been applied. Similarly, as the loading bays are located on the screened side of the buildings closest to NSRs 15 through to 18, no penalty has been applied at these receptors to account for impulsivity.

10.119. Although operations will include activities which are individually intermittent, it is considered that many of these operations will overlap, which will give the impression of the site operating consistently.

10.120. The L_{A90} value used for each period is the lowest calculated L_{A90} value reported in Tables 10.17 to 10.20. The previous version of BS 4142:1997 Method for rating industrial noise

affecting mixed residential and industrial areas[35] referred to rating levels below 35 dB as "very low" and stated that such levels were outside of the scope of the standard. Given that an external rating level of 35dB would result in an internal level of 20dB, assuming a 15dB loss through a partially open window, this would infer a betterment of 10dB with respect to the night-time internal guidance level for bedrooms from BS 8233:2014. Therefore, a lower rating limit of 35dB has been applied where appropriate.

10.121. The BS 4142 assessment for the weekday and weekend daytime and night–time periods is shown below in Tables 10.34, 10.35, 10.36, and 10.37 below. From a review of available aerial photography, NSRs 5 and 9 do not appear to have any residential elements associated with them, and are therefore not considered to be a sensitive receptor during the night-time.

Table 10.34: Operational noise assessment – Weekday daytime (0700-2300)

NSR	Description					
	Specific noise level (dB L_s)	Acoustic correction feature	Rating level (dB $L_{A,Tr}$)	Background (dB L_{A90})	Excess over background	Magnitude of impact
1	47	2	49	35	+14	**High**
2	48	5	53	35	+18	**High**
3	45	5	50	35	+15	**High**
4	49	5	54	35	+19	**High**
5	48	5	53	35	+18	**High**
6	48	5	53	35	+18	**High**
7	45	5	50	35	+15	**High**
8	48	5	53	35	+18	**High**
9	54	6	60	41	+19	**High**
10	48	3	51	41	+10	**High**
11	45	-	45	41	+4	**Medium**
12	26	-	26	41	-15	**Very Low**
13	25	-	25	41	-16	**Very Low**
14	35	-	35	47	-12	**Very Low**
15	39	-	39	47	-8	**Very Low**
16	39	-	39	47	-8	**Very Low**
17	39	-	39	47	-8	**Very Low**
18	40	-	40	35	+5	**Medium**
19	44	5	49	35	+14	**High**
20	41	5	46	35	+11	**High**
24	55	10	65	35	+30	**High**
25	51	5	56	35	+21	**High**

[35] British Standard BS4142:1997 Method for rating industrial noise affecting mixed residential and industrial areas

NSR	Description					
	Specific noise level (dB L_s)	Acoustic correction feature	Rating level (dB $L_{A,Tr}$)	Background (dB L_{A90})	Excess over background	Magnitude of impact
26	50	5	55	35	+20	**High**

10.122. During the daytime on a weekday, noise levels associated with the operation of the SRFI are between -15 and +30 dB above the measured background sound levels during the daytime, dependent on the NSR.

10.123. The unmitigated effect of operational noise associated with the SRFI is likely to be a permanent, major adverse at worst for NSRs located closest to the Proposed Development during the daytime on a weekday. For NSRs 11 and 18, the impact is predicted to be permanent, moderate adverse effect. For NSRs 12 through to 17, the impact is predicted to be permanent, negligible adverse effect.

Table 10.35: Operational noise assessment – Weekday, night-time (2300-0700)

NSR	Description					
	Specific noise level (dB L_s)	Acoustic correction feature	Rating level (dB $L_{A,Tr}$)	Background (dB L_{A90})	Excess over background	Magnitude of impact
1	50	2	52	35*	+17	**High**
2	50	5	55	35*	+20	**High**
3	48	5	53	35*	+18	**High**
4	50	5	55	35*	+20	**High**
5	-	-	-	-	-	**-**
6	48	5	53	35*	+18	**High**
7	50	5	55	35*	+20	**High**
8	49	5	54	35*	+19	**High**
9	-	-	-	-	-	**-**
10	44	3	47	39	+8	**Medium**
11	49	-	49	39	+10	**High**
12	39	-	39	39	0	**Low**
13	40	-	40	39	+1	**Low**
14	39	-	39	40	-1	**Very Low**
15	40	-	40	40	0	**Low**
16	39	-	39	40	-1	**Very Low**
17	40	-	40	40	0	**Low**
18	-	-	-	-	-	**-**

NSR	Description					
	Specific noise level (dB L_s)	Acoustic correction feature	Rating level (dB $L_{A,Tr}$)	Background (dB L_{A90})	Excess over background	Magnitude of impact
19	-	-	-	-	-	-
20	41	5	46	35*	+11	**High**
24	55	10	65	35*	+30	**High**
25	51	5	56	35*	+21	**High**
26	51	5	56	35*	+21	**High**

10.124. During the night-time on a weekday, noise levels associated with the operation of the SRFI are between -1 and +30 dB above the measured background noise levels during the night-time, dependent on the NSR.

10.125. The unmitigated effect of operational noise associated with the SRFI is likely to be a permanent, major adverse at worst for NSRs located closest to the Proposed Development during the night-time on a weekday. For NSRs located further away from the Proposed Development, the effect is likely to be permanent, minor adverse and permanent, negligible adverse.

Table 10.36: Operational noise assessment – Weekend daytime (0700-2300)

NSR	Description					
	Specific noise level (dB L_s)	Acoustic correction feature	Rating level (dB $L_{A,Tr}$)	Background (dB L_{A90})	Excess over background	Magnitude of impact
1	47	2	49	43	+6	**Medium**
2	48	5	53	43	+10	**High**
3	45	5	50	43	+7	**Medium**
4	49	5	54	43	+11	**High**
5	48	5	53	43	+10	**High**
6	48	5	53	43	+10	**High**
7	45	5	50	43	+7	**Medium**
8	48	5	53	43	+10	**High**
9	54	6	60	50	+10	**High**
10	48	3	51	50	+1	**Low**
11	45	-	45	50	-5	**Very Low**
12	26	-	26	50	-24	**Very Low**
13	25	-	25	50	-25	**Very Low**
14	35	-	35	51	-16	**Very Low**
15	39	-	39	51	-12	**Very Low**

NSR	Description					
	Specific noise level (dB L_s)	Acoustic correction feature	Rating level (dB $L_{A,Tr}$)	Background (dB L_{A90})	Excess over background	Magnitude of impact
16	39	-	39	51	-12	**Very Low**
17	39	-	39	51	-12	**Very Low**
18	40	-	40	42	-2	**Very Low**
19	44	5	49	42	+7	**Medium**
20	41	5	46	43	+3	**Low**
24	55	10	65	43	+22	**High**
25	51	5	56	43	+13	**High**
26	50	5	55	43	+12	**High**

10.126. During the daytime on a weekend, noise levels associated with the operation of the SRFI are between -25 and +22 dB above the measured background noise levels during the daytime, dependent on the NSR. Therefore, at worst, there will be a permanent, major adverse effect, depending on context.

10.127. The unmitigated effect of operational noise associated with the SRFI is likely to be a permanent, major adverse at worst for NSRs located closest to the Proposed Development during the daytime on a weekend. For the majority of NSRs located further away from the Proposed Development, the effect is likely to be permanent, minor adverse and permanent, negligible adverse.

Table 10.37: Operational noise assessment – Weekend, night-time (2300-0700)

NSR	Description					
	Specific noise level (dB L_s)	Acoustic correction feature	Rating level (dB $L_{A,Tr}$)	Background (dB L_{A90})	Excess over background	Magnitude of impact
1	50	2	52	38	+14	**High**
2	50	5	55	38	+17	**High**
3	48	5	53	38	+15	**High**
4	50	5	55	38	+17	**High**
5	-	-	-	-	-	**-**
6	48	5	53	38	+15	**High**
7	50	5	55	38	+17	**High**
8	49	5	54	38	+16	**High**
9	-	-	-	-	-	**-**
10	44	3	47	42	+5	**Medium**
11	49	-	49	42	+7	**Medium**

NSR	Description					
	Specific noise level (dB L_s)	Acoustic correction feature	Rating level (dB $L_{A,Tr}$)	Background (dB L_{A90})	Excess over background	Magnitude of impact
12	39	-	39	42	-3	**Very Low**
13	40	-	40	42	-2	**Very Low**
14	39	-	39	44	-5	**Very Low**
15	40	-	40	44	-4	**Very Low**
16	39	-	39	44	-5	**Very Low**
17	40	-	40	44	-4	**Very Low**
18	-	-	-	-		**-**
19	-	-	-	-		**-**
20	41	5	46	38	+8	**Medium**
24	55	10	65	38	+27	**High**
25	51	5	56	38	+18	**High**
26	51	5	56	38	+18	**High**

10.128. During the night-time on a weekend, noise levels associated with the operation of the SRFI are between -5 and +30 dB above the measured background noise levels during the night-time, dependent on the NSR.

10.129. The unmitigated effect of operational noise associated with the SRFI is likely to be a permanent, major adverse at worst for NSRs located closest to the Proposed Development during the night-time on a weekend. For the majority of NSRs located further away from the Proposed Development, the effect is likely to be permanent, minor adverse and permanent, negligible adverse.

Context

10.130. The results of the assessment indicate that adverse impacts may be experienced at NSRs during the periods under consideration. However, BS 4142 states that '*the significance of sound of an industrial and/or commercial nature depends upon both the margin by which the rating level of the specific sound source exceeds the background sound level and the context in which the sound occurs*'. Therefore, the context has been considered below for those receptors that may experience adverse impacts as a result of operational noise associated with the Proposed Development.

10.131. BS 4142 goes on to state that 'where background sound levels and levels are low, absolute levels might be as, or more, relevant than the margin by which the rating level exceeds the background'.

10.132. The sound rating levels have been compared to the existing noise climate at each receptor where an adverse impact is predicted, for the daytime and night-time for both the weekday and weekend periods.

Table 10.38: Increase in ambient noise levels – Weekday

Increase in noise level due to operational noise from the SRFI – Weekday								
NSR	Daytime (0700 – 2300)				Night-time (2300 – 0700)			
	Rating level	Ambient level	Rating + ambient	Increase	Rating level	Ambient level	Rating + ambient	Increase
1	49.0	61.3	61.5	**+0.2**	52.0	60.5	61.1	**+0.6**
2	53.0		61.9	**+0.6**	55.0		61.6	**+1.1**
3	50.0		61.6	**+0.3**	53.0		61.2	**+0.7**
4	54.0		62.0	**+0.7**	55.0		61.6	**+1.1**
5	53.0		61.9	**+0.6**	-		-	**-**
6	53.0		61.9	**+0.6**	53.0		61.2	**+0.7**
7	50.0		61.6	**+0.3**	55.0		61.6	**+1.1**
8	53.0		61.9	**+0.6**	54.0		61.4	**+0.9**
9	60.0	48.6	60.3	**+11.7**	-	46.3	-	**N/A**
10	51.0		53.0	**+4.4**	47.0		49.7	**+3.4**
11	45.0		50.2	**+1.6**	49.0		50.9	**+4.6**
18	40.0	48.6	49.2	**+0.6**	-	-	-	**-**
19	49.0		51.8	**+3.2**	-		-	**-**
20	46.0	61.3	61.4	**+0.1**	46.0	60.5	60.7	**+0.2**
24	65.0		66.5	**+5.2**	65.0		66.3	**+5.8**
25	56.0		62.4	**+1.1**	56.0		61.8	**+1.3**
26	55.0		62.2	**+0.9**	56.0		61.8	**+1.3**

10.133. Table 10.38 shows that for the majority of NSRs, the existing ambient noise levels are predicted to increase by up to 3.5dB during the weekday daytime and night-time as a result of the proposed operations of the SRFI.

10.134. This level of change is considered marginal, and would barely be perceptible to the human ear with changes of 3dB only just perceptible under laboratory conditions. As such, an increase of 3.5dB is considered to be low, which is likely to result in a permanent, minor adverse effect when context is taken into consideration.

10.135. For NSRs 9, 10, 11 and 24 the existing ambient noise levels is predicted to increase significantly. Therefore, this is likely to result in a permanent, major adverse effect at worst.

Table 10.39: Increase in ambient noise levels – Weekend

Increase in noise level due to operational noise from the SRFI – Weekend								
NSR	Daytime				Night-time			
	Rating level	Ambient level	Rating + ambient	Increase	Rating level	Ambient level	Rating + ambient	Increase
1	49.0	59.4	59.8	**+0.4**	52.0	49.9	54.1	**+4.2**
2	53.0		60.3	**+0.9**	55.0		56.2	**+6.3**
3	50.0		59.9	**+0.5**	53.0		54.7	**+4.8**
4	54.0		60.5	**+1.1**	55.0		56.2	**+6.3**
5	53.0		60.3	**+0.9**	-		-	**-**
6	53.0		60.3	**+0.9**	53.0		54.7	**+4.8**
7	50.0		59.9	**+0.5**	55.0		56.2	**+6.3**
8	53.0		60.3	**+0.9**	54.0		55.4	**+5.5**
9	60.0	52.2	60.7	**+8.5**	-	46.5	N/A	**N/A**
10	51.0		54.7	**+2.5**	47.0		49.8	**+3.3**
11	45.0		53	**+0.8**	49.0		50.9	**+4.4**
18	40.0	47.8	48.5	**+0.7**	-	-	-	**-**
19	49.0		51.5	**+3.7**	-		-	**-**
20	46.0	59.4	59.6	**+0.2**	46.0	49.9	51.4	**+1.5**
24	65.0		66.1	**+6.7**	65.0		65.1	**+15.2**
25	56.0		61	**+1.6**	56.0		57	**+7.1**
26	55.0		60.7	**+1.3**	56.0		57	**+7.1**

10.136. Table 10.39 shows that for all NSRs during the daytime on a weekend, with the exception of NSRs 9 and 24, the existing ambient noise levels are predcited to increase by up to 3.7dB as a result of the proposed operation of the SRFI.

10.137. As discussed above, this level of change is considered marginal, and would barely be perceptible to the human ear. As such, an increase of 3.5dB is considered to be low, which is likely to result in a permanent, minor adverse effect when context is taken into consideration.

10.138. For NSRs 1 through 8, 11 and NSRs 25 and 26 during the night-time, and NSRs 9 and 24 the existing ambient noise levels is predicted to increase significantly. Therefore, this is likely to result in a permanent, major adverse effect at worst.

10.139. It is worth noting that the assessment is based on a worst-case 1-hour period for the daytime and 15-minute period for the night-time. Therefore, it is considered reasonable that for other periods, the impacts will be less than those stated above.

10.140. It is also worth noting that, with the exception of NSRs 24 and 25, the rating levels at the remainder of the receptors is below the 55dB criterion for garden areas given in the WHO

Guidelines and BS 8233:2014.

10.141. Further consideration has been given to mitigation measures required to allow an appropriate level of protection to existing receptors further in this Chapter.

Assessment of operational maximum noise levels

10.142. An assessment has been undertaken to determine the impact of transient event noise such as bangs, at nearby NSRs during the night-time. The highest L_{AFmax} noise levels are likely to result from tug activity associated with connecting to trailers, reach stackers and/or cranes handling containers.

10.143. The criterion adopted for the assessment is based on a free-field external level of 60dB L_{AFmax} which should not be exceeded. Based on an open window providing approximately 15dB reduction, in accordance with BS 8233, this would result in an internal level of 45dB $L_{AF,max}$ which is not to be exceeded more than 10-15 times per night, in accordance with WHO Guidelines.

10.144. The following sources, which has been taken from Appendix 8.5 of the ES chapter for Northampton Gateway[36], and have been included within the noise model as point sources. A number of points have been included for each source within the area that the source will operate.

Table 10.40: Source data for maximum noise levels

Source	Modelled height (m)	Equivalent maximum octave band sound power levels (L_w dB)							
		63Hz	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz	8kHz
HGV Coupling	1.5	113	106	107	108	108	107	102	92
Gantry crane – spreader impact	20	102	116	115	115	111	106	100	92
Reach stacker – container placement	20	120	122	121	120	116	115	106	102

10.145. The predicted noise levels at the facades of the closest NSRs are detailed below in Table 10.41. As NSRs 5 and 9 are not considered to be sensitive during the night-time, these receptors have not been included within the following assessment.

[36] Appendix 8.5 Summary of assumptions for SRFI operational activities

Table 10.41: Predicted L_{AFmax} noise level at each receptor

NSR	Source	Predicted external $L_{AF,max}$	Level above 60dB L_{AFmax} criterion
1	HGV coupling	49	-11
	Spreader impact	59	-1
	Container placement	62	+2
2	HGV coupling	44	-16
	Spreader impact	54	-6
	Container placement	58	-2
3	HGV coupling	44	-16
	Spreader impact	51	-9
	Container placement	58	-8
4	HGV coupling	49	-11
	Spreader impact	54	-6
	Container placement	59	-1
6	HGV coupling	50	-10
	Spreader impact	54	-6
	Container placement	59	-1
7	HGV coupling	52	-8
	Spreader impact	57	-3
	Container placement	62	+2
8	HGV coupling	49	-11
	Spreader impact	53	-7
	Container placement	59	-1
10	HGV coupling	17	-43
	Spreader impact	28	-32
	Container placement	48	-12
11	HGV coupling	18	-42
	Spreader impact	38	-22
	Container placement	55	-5
20	HGV coupling	38	-22
	Spreader impact	47	-13
	Container placement	54	-6
24	HGV coupling	53	-7
	Spreader impact	64	+4
	Container placement	66	+6
25	HGV coupling	50	-10
	Spreader impact	54	-6
	Container placement	62	+2
26	HGV coupling	51	-9
	Spreader impact	54	-6
	Container placement	64	+4

10.146. The results indicate that for the majority of receptors, the resultant $L_{AF,max}$ value for each of the identified sources will be below the criterion of 60dB $L_{AF,max}$ externally at the nearest façade in free-field conditions. Therefore, the resultant effect for NSRs where the predicted level is likely to be lower than 5dB below the adopted criteria, is predicted to be permanent, negligible adverse. For NSR24, the effect is predicted to be permanent, major adverse, therefore, consideration has been given to mitigation further in this Chapter.

Noise from fixed plant, equipment and break-out noise

10.147. It is anticipated that there may be fixed plant and equipment associated with the Proposed Development that may have the potential to generate noise. This includes break-out noise from the proposed units due to noise generation internally. However, at this stage, details of the proposed type, number and precise location of any such plant or the nature of its operation are not available. In the absence of detailed information, it is appropriate to specify suitable noise control limits to which any plant, equipment and break-out noise should conform. These limits should include any appropriate corrections for acoustic characteristics, in accordance with BS 4142.

10.148. In the absence of a specific criteria, it is considered that the rating level of fixed plant noise sources should not increase the prevailing background sound level when measured at the nearest NSRs. The cumulative effect of all external plant should be specified so that the rating level is less than to the lowest prevailing background sound level.

10.149. Noise from external plant on the development site should therefore be designed to achieve the noise level limits shown in Table 10.42. It is assumed that if the limits are met at these receptors, then the limits will also be achieved at receptors located further away.

Table 10.42: Noise limits from fixed plant

NSR	Rating level limit to be achieved (dB $L_{Ar,Tr}$)			
	Weekday		Weekend	
	Daytime (0700-2300)	Night-time (2300-0700)	Daytime (0700-2300)	Night-time (2300-0700)
1	35	35*	43	36
3	35	35*	43	36
9	41	39	50	41
10	41	39	50	41
12	41	39	50	41
13	41	39	50	41
14	48	40	51	44
15	48	40	51	44
16	48	40	51	44
17	48	40	51	44
18	35	35*	42	35*
19	35	35*	42	35*

NSR	Rating level limit to be achieved (dB $L_{Ar,Tr}$)			
	Weekday		Weekend	
	Daytime (0700-2300)	Night-time (2300-0700)	Daytime (0700-2300)	Night-time (2300-0700)
20	35	35*	43	35*
24	35	35*	43	36
Background noise levels at these locations are considered to be very low and therefore a limit of 35dB has been adopted, as previously discussed (see paragraph 9.91)				

10.150. For context, to achieve a level of 35dB at NSR24, which is located approximately 50m from the Main HNRFI Site boundary, the item of fixed plant could have a maximum rated noise level of up to 69dB measured at 1m. A typical air handling unit produces a noise level of between 57dB (A) and 67dB (A) at 1m dependant on the model. It is therefore considered that with careful selection of plant, the above limits can be achieved.

10.151. Should an item of plant be located closer to a receptor, the noise level from the plant would need to be lower or located on the screened side of the buildings. Notwithstanding this, given the location of the proposed units and the distances to the NSRs, the above plant limits should be achieved.

10.152. The above rating level limits apply at least 3.5 metres from the façade of any residential property i.e. in free-field conditions. The rating level limits apply at the boundary of NSRs 18 and 19.

10.153. In accordance with BS 4142, the assessment of plant noise emissions should include appropriate rating corrections for tonal, irregular or intermittent plant where applicable, before comparison with the above limits.

10.154. Once the detailed nature of such future uses is confirmed, noise from any fixed plant, equipment and break-out noise can be considered to ensure that the above limits can be met.

10.155. It should be noted that the derived rating level limits would be applicable to the total noise from the simultaneous operation of all external plant, equipment and break-out noise serving the Proposed Development. As such, noise emissions from individual sources will need to be lower than the given limit, although the exact limit for each individual source will be dependent upon its type, noise characteristics, location etc. This issue is best addressed during the detailed design stage.

10.156. Should the limits set out in Table 10.42 be met, it is likely that any effect would be limited to a permanent, minor adverse effect at worst.

Noise from off-site rail movements

10.157. The change in noise level as a result of the additional rail movements associated with the Proposed Development have been calculated based on the existing and proposed train

movements.

10.158. It is recognised that the on-going situation with COVID-19 and Brexit is likely to affect movements on the line. However, in the absence of information on known movements prior to March 2020, Realtimetrains[37] has been used to provide the baseline for the existing movements at the current time on a weekday. This provides a comprehensive timetable detailing the scheduled and actual train movements on a given line for the previous seven days.

10.159. The study area is defined earlier in this Chapter. A typical daytime and night-time period has been used as a basis for the assessment, and a number of assumptions have been made regarding the types of trains using the line, the speed and the length. These are detailed below in Table 10.43.

Table 10.43: Assumptions regarding existing trains

Train type	Assumed speed (Kph)	Assumed composition	No. of daytime two-way movements based on known movements	No. of night-time two-way movements based on known movements
Turbostar Class 170	120	2 carriages	64	5
Class 66 with disc braked freight vehicles	105	1 locomotive and 25 wagons	41	21

10.160. It is understood that there will be a maximum of 16 intermodal train movements per day as a result of the Proposed Development, which will result in an additional 32 one-way movements. In the absence of detailed information, it is assumed that the movements will be spread evenly throughout the day. This results in 21 movements during the daytime (0700-2300) and 11 movements during the night-time (2300-0700).

10.161. As CRN does not include current rail stock, reference has also been made to the additional guidance published by DEFRA '*Additional railway noise source terms for Calculation of Railway Noise 1995*'.

10.162. The noise levels have been calculated in accordance with CRN at a notional receptor 25m from the existing line. A notional receptor was used because the change in rail noise adjacent to any rail line will be the same at all distances where noise from that route is dominant. The results are shown below in Table 10.44.

[37] http://www.realtimetrains.co.uk

Table 10.44: Predicted change in rail traffic noise levels as a result of the additional movements

Period	Calculated Noise Level, dB $L_{Aeq,T}$			Change
	Existing	Proposed	Existing + proposed	
16-hour daytime	62.3	58.7	63.9	+1.6
8-hour night-time	61.8	58.9	63.6	+1.8

10.163. The highest change is predicted to be +1.8dB which will result in a permanent, minor adverse effect. This is not considered significant in EIA terms and therefore mitigation is not considered warranted at this time.

Vibration from off-site rail movements

10.164. Although baseline vibration monitoring has previously been undertaken by Hydrock in July 2018, further monitoring is required to undertake a detailed assessment, which will be included within the full Noise and Vibration ES chapter.

10.165. The existing line is used by both passenger and freight trains, and as previously discussed, there will be a maximum of 16 intermodal train movements per day as a result of the Proposed Development. In the absence of detailed information, it has been assumed that there will be 21 movements during the daytime (0700-2300) and 11 movements during the night-time (2300-0700).

10.166. The nearest dwelling to the Proposed Development is located approximately 70m from the existing line, with the remaining receptors located further away. It is acknowledged that there are other receptors located further away, which will be closer to the existing line than 70m. Similar to the study area for off-site rail movements, the assessment will be undertaken for a notional receptor.

10.167. Although it is not possible to state the magnitude of effect of vibration as a result of the additional train movements, it is anticipated that rail vibration is currently at levels considered to be low, to the extent whereby the additional vibration generated by the Proposed Development is likely to result in a low level. Therefore, the resultant impact is likely to be low, which would infer there is likely to be, at worst, a permanent, long term, minor adverse effect.

Off-site road traffic noise impacts

10.168. The results of the traffic assessment were used as the basis for determining the change in road traffic noise levels that would result from development generated road traffic on the surrounding roads.

10.169. The roads included within the assessment are those which are likely to experience at least

a 25% increase in total vehicles or at least a 2% increase in HGVs as a result of the Proposed Development. This equates to around a 1dB increase in the noise level and therefore should be scoped into the assessment, in accordance with DMRB.

10.170. Road traffic noise calculations were carried out in accordance with CRTN, being undertaken for a notional receptor location 10m from the edge of the carriageway of each road considered, and 1.5m above ground level. A notional receptor was used because the change in road traffic noise level adjacent to any given road will be the same at all distances where noise from that route is dominant. Traffic noise calculations were undertaken to establish the change in weekday daytime $L_{A10,18h}$ noise level, and weekday night-time $L_{A10,8h}$ noise level.

10.171. To quantify short term effects, calculations have been undertaken for the opening year 2026 both with and without the Proposed Development. Road traffic speeds have been applied based on information provided by the Transport Consultant. The traffic data supplied has included for other committed developments for the assessment year. Roads which are predicted to have low flows (i.e less than 1,000 vehicles) have been removed from the assessment as these are outside the scope of CRTN. The assessment is based on one-way or two way flows for each link, dependant on the road type.

10.172. For the vast majority of road links assessed in 2026, the predicted increase is up to +3dB which in accordance with DMRB is likely to result in a permanent, minor, adverse effect during the daytime as a result of the additional road traffic in the short term.

10.173. There are seven links where the predicted increase is up to +3.8dB which in accordance with DMRB is likely to result in a permanent, moderate adverse effect during the daytime in the short term. These are shown below in Table 10.45.

Table 10.45: Road links predicted to experience an increase in the BNL of between 3.5dB and 5dB in the short-term

Road link	A Node – B Node	2026 No development $L_{A10,18h}$	2026 With development $L_{A10,18h}$	Increase in noise due to the Proposed Development
B4669	30022 - 30167	65.9	68.9	+3
B4669	30022 - 30050	64.3	67.4	+3.1
B4669	30141 - 30184	67.8	71.0	+3.2
B4669	30092 - 30184	64.3	67.7	+3.4
B4669	30092 - 39996	62.6	66.2	+3.6

Road link	A Node – B Node	2026 No development $L_{A10,18h}$	2026 With development $L_{A10,18h}$	Increase in noise due to the Proposed Development
Off slip - Junction 2 M69	30500 - 30504	64.5	68.3	+3.8
On slip – Junction 2 M69	30503 - 30501	65.4	68.9	+3.5

10.174. Review of dwellings located on these links indicate that for the majority of dwellings, garden areas are located to the rear of dwellings and are therefore screened from road traffic sources. Consideration has been given to mitigation further in this Chapter.

10.175. There are six links where the predicted increase is up to +8.8dB, which is likely to result in a permanent, major adverse effect during the daytime. These are shown below in Table 10.46.

Table 10.46: Road links predicted to experience an increase in the BNL greater than 5dB in the short-term

Road link	A Node – B Node	2026 No development $L_{A10,18h}$	2026 With development $L_{A10,18h}$	Increase in noise due to the Proposed Development
Roundabout – Junction 2 M69	30196 – 37001	66.9	73.0	+6.1
Roundabout – Junction 2 M69	30197 – 37006	66.6	73.1	+6.5
Roundabout – Junction 2 M69	30503 – 30504	62.9	71.7	+8.8
Roundabout – Junction 2 M69	30504 – 30197	66.1	73.0	+6.9
Roundabout – Junction 2 M69	37001 – 30503	66.9	73.3	+6.4
Roundabout – Junction 2 M69	37003 - 30196	66.6	73.0	+6.4

10.176. Although NSR14, shown on Figure 10.1, is located near to junction 2, as the increase in noise level is only predicted to occur on the roundabout and the motorway slip roads, and the dwelling is located adjacent to the M69 where noise levels will be dominated by road traffic on the motorway, it is considered that the impact will be reduced.

10.177. Similarly, in order to account for the potential effects over the 8-hour night-time period

(23:00 – 07:00), an assessment has been undertaken. The night-time noise levels were approximated using the BNL method which, in the absence of an established method, is considered the most appropriate way to consider the night-time effects.

10.178. The majority of the roads that were assessed during the night-time period in 2026, have low flows and therefore fall outside the scope of CRTN. For the reminder of the roads, the predicted increase is up to 2.6dB. Therefore, there is predicted to be a permanent, negligible adverse effect during the night-time as a result of additional road traffic in the long- term.

10.179. To quantify long term effects, calculations have been undertaken for the future year 2036, both with and without the Proposed Development. For the vast majority of road links assessed in 2036, the predicted increase is up to +4.4dB which in accordance with DMRB is likely to result in a permanent, minor, adverse effect during the daytime as a result of the additional road traffic in the long-term.

10.180. There are six links where the predicted increase is up to +9.1dB which in accordance with DMRB is likely to result in a permanent, moderate adverse effect during the daytime in the long term. These are shown below in Table 10.47.

Table 10.47: Road links predicted to experience an increase in the BNL greater than 5dB in the long-term

Road link	A Node – B Node	2036 No development $L_{A10,18h}$	2036 With development $L_{A10,18h}$	Increase in noise due to the Proposed Development
Roundabout – Junction 2 M69	30196 – 37001	66.9	73.1	+6.2
Roundabout – Junction 2 M69	30197 – 37006	66.5	73.4	+6.9
Roundabout – Junction 2 M69	30503 – 30504	63.1	72.2	+9.1
Roundabout – Junction 2 M69	30504 – 30197	65.9	73.4	+7.5
Roundabout – Junction 2 M69	37001 – 30503	66.9	73.6	+6.7
Roundabout – Junction 2 M69	37003 - 30196	66.5	73.2	+6.7

10.181. As previously discussed, NSR14 is located near to junction 2, however as the increase in noise level is only predicted to occur on the roundabout, and the dwelling is located adjacent to the M69, it is considered that the impact will be reduced.

10.182. Similar to the short-term, the majority of the roads that were assessed during the night-time period in 2036, have low flows and therefore fall outside the scope of CRTN. For the reminder of the roads, the predicted increase is up to 2dB. Therefore, there is predicted to be a permanent, minor adverse effect during the night-time as a result of additional road traffic in the short- term.

10.183. It is also worth noting that the noise level is predicted to decrease as a result of the Proposed Development, and further information of these links will be provided in full in the ES.

10.184. A review has been undertaken of the off-site road links. This indicates that for the majority of the junctions, there is unlikely to be an impact from a noise perspective. Potential impacts have been identified for junction 19 due to an increase in road traffic and at Junction 29, due to the location of the flare increase on the entry arm, and the presence of nearby receptors. Further consideration will be given to these junctions within the ES.

A47 link road

10.185. The proposed link road has been included within the noise model to determine the change in road traffic noise levels for the future year 2036, with the Proposed Development in place.

10.186. In addition to the prediction methodologies detailed above, the following has also been adopted:

- The noise model was set up to apply the noise prediction methodology set out in the 1988 Department for Transport (DfT) and the Welsh Office document Calculation of Road Traffic Noise for road traffic noise sources.
- A 10x10m grid spacing was used at a calculated height of 4m above local ground height.
- The buildings associated with the Proposed Development have been included within the model to provide a worst-case scenario.

10.187. To quantify the impact of noise from the proposed link road, the noise exposure has been calculated for nearby NSRs. The $L_{A10,18hr}$ AAWT value has been included within the noise model, and adjusted by -2dB to approximate the $L_{Aeq,16h}$ value, in accordance with CRTN methodology, and the resultant level has been predicted at NSRs for the daytime period only. The resultant noise contour is shown in Figure 10.3.

Table 10.48: Resultant daytime noise levels at NSRs as a result of the A47 link road

Receptor	Garden (1.5m) dB $L_{Aeq,16h}$	First Floor (4m) dB $L_{Aeq,16h}$	Magnitude of impact
NSR1	57	57	**High**

Receptor	Garden (1.5m) dB $L_{Aeq,16h}$	First Floor (4m) dB $L_{Aeq,16h}$	Magnitude of impact
NSR2	44	45	**Low**
NSR3	43	44	**Very Low**
NSR4	42	44	**Very Low**
NSR5	42	-	**Very Low**
NSR6	41	43	**Very Low**
NSR7	41	42	**Very Low**
NSR8	40	41	**Very Low**
NSR9	32	-	**Very Low**
NSR10	29	31	**Very Low**
NSR11	32	32	**Very Low**
NSR12	37	37	**Very Low**
NSR13	29	42	**Very Low**
NSR14	47	49	**Low**
NSR15*	61	62	**High**
NSR16	48	48	**Low**
NSR17	49	50	**Low**
NSR18	45	-	**Low**
NSR19	53	-	**Medium**
NSR20	51	54	**Medium**
NSR21	54	56	**High**
NSR22	51	-	**Medium**
NSR23	45	-	**Low**
NSR24	41	41	**Very Low**
NSR25	39	40	**Very Low**
NSR26	38	40	**Very Low**

**This has been taken as the NSR closest to the road.*
[1] Calculated at ground floor.

10.188. The results indicate that there will be a permanent negligible, and permanent minor, adverse impact at the majority of NSRs. However, for NSRs 1, 15, 19, and 20, there is predicted to be a permanent, moderate to major adverse effect. Therefore, consideration has been given to mitigation.

10.189. There is also predicted to be a permanent, moderate and major adverse effects at NSRs 21 and 22, respectively. However, further baseline noise monitoring is required to characterise the existing baseline noise levels in the area, and therefore the overall effect of road traffic noise on the proposed link road. This will be completed at a later stage.

Assessment of tranquillity

10.190. Although various approaches have been put forward in the past to determine the impact of a development on tranquillity, there is no industry standard approach. Therefore, the assessment methodology draws on multiple sources such as local open space policies, BS

8233:2014, WHO Guidelines (1999) and IEMA Guidelines.

10.191. The site is currently defined as countryside in accordance with the Blaby District Local Plan and further defined as wooded farmland in accordance with the Blaby Landscape and Settlement Character Assessment.

10.192. The Blaby Landscape and Settlement Character Assessment identifies the majority of the site as Aston Flamville Wooded Farmland, with Elmesthorpe Floodplain located to the north of the railway line. Stoney Stanton to the south is defined as rolling farmland.

10.193. The site is bordered by Burbage Common and Woods which is designated as a Local Nature Reserve. Part of this and the adjacent Aston Firs woodland is also designated as a Site of Special Scientific Interest (SSSI).

10.194. HBBC Allocations, Designations and Development Management DPD provides a detailed review of the boundaries of the countryside. The majority of the site has been designated as Countryside with the exception of Aston Firs which is designated as a SSSI and areas of Burbage Common which are designated as a nature reserve. In addition, the Hinckley and Bosworth Landscape Character Assessment identifies areas of Burbage Common as rolling farmland.

10.195. There are a number of footpaths across the site and within the surrounding areas, most notably through the adjoining woodland to the west. In addition, the Proposed Development site is accessible by walkers and members of the general public.

10.196. In accordance with the Blaby Green Space Strategy and The Blaby Landscape and Settlement Character Assessments, it is considered that the tranquillity assessment should ensure that significant effects are minimised from new development in the area.

10.197. To determine the impact, the change in the absolute noise level has been determined as a result of operational noise levels associated with the Proposed Development, including road traffic on the proposed A47 link road.

10.198. The assessment has been undertaken for the daytime periods only, as this is when the area will be used by members of the public. The noise levels as a result of the Proposed Development, including HGV movements, loading/unloading activities and operations associated with the SRFI facility have been predicted at Burbage Common Woods. The lowest measured 16-hour L_{Aeq} noise levels measured at ML2 for the weekday and weekend have been used to establish the baseline noise levels. A noise level of 49dB $L_{Aeq,T}$ has been used for the daytime period on a weekday and 48dB $L_{Aeq,T}$ has been used for the daytime on a weekend.

10.199. For Aston Firs and Freeholt Wood, the lowest measured 16-hour L_{Aeq} noise levels measured at ML1 for the weekday and weekend have been used to establish the baseline noise levels. A noise level of 50dB $L_{Aeq,T}$ has been used for the daytime period on a weekday and 53dB $L_{Aeq,T}$ has been used for the daytime on a weekend. The results are shown below in Table 10.49.

Table 10.49: Predicted change in absolute noise level

NSR	Daytime 16-hour period (0700 – 2300)			Resultant future noise level dB $L_{Aeq,16h}$	Change
		Existing measured level – dB $L_{Aeq,16h}$	Future contribution from Proposed Development – Calculated dB $L_{Aeq,16h}$		
Burbage Common Woods	Weekday	48.6	53.1	54.4	+5.8
	Weekend	47.8		54.2	+6.4
Aston Firs	Weekday	50.2	46.3	51.7	+1.5
	Weekend	53.2		54	+0.8
Freeholt Wood	Weekday	50.2	53.8	55.4	+5.2
	Weekend	53.2		56.5	+3.3

10.200. Table 10.49 shows that for Aston Firs during a weekday and weekend, the effect on tranquillity will be permanent negligible adverse, in accordance with Table 10.13.

10.201. The resultant effect at Freeholt Woods on a weekend as a result of operational noise will be permanent, minor adverse. A moderate adverse effect is predicted at Freeholt Wood on a weekday, and Burbage Common Woods on a weekday and weekend.

10.202. However, review of the resultant noise levels indicates that, with the exception of Freeholt Wood on a weekend, these are all below the upper guideline value of 55dB $L_{Aeq,16h}$ for external areas in accordance with WHO guidelines and BS 8233. It is therefore considered that the amenity of visitors to these areas will be protected.

10.203. It is recognised that some areas of Burbage Common Wood may experience noise levels above those predicted above, particularly where the woods are in close proximity to the proposed link road. However, for the majority of the woods, the noise levels will be lower than those stated above.

10.204. It is also worth noting that a review of the noise model indicates that the proposed noise levels are dominated by road traffic on the proposed link road. As the site is already surrounded by busy roads, and the background noise levels are characterised by road traffic, it is considered that the resultant noise levels will not be out of character.

10.205. Based on the above, with the exception of Freeholt Woods on a weekend, it is considered that the resultant effect will be permanent, minor adverse, and further consideration to mitigation is not required at this time. A moderate, adverse impact is likely to remain at Freeholt Woods, and consideration is given to mitigation further in this Chapter.

PROPOSED MITIGATION

10.206. Where the assessments have identified effects greater than 'minor adverse', consideration has been given to further mitigation measures.

Construction noise and vibration

10.207. The preferred approach for controlling construction noise and vibration is to reduce levels at source where possible, but with due regard to practicality. Sometimes a greater noise level may be acceptable if the overall construction time, and therefore length of disruption, is reduced.

10.208. All work outside 0800 and 1800 hours Monday to Friday will be subject to prior agreement of, and/or reasonable notice to BDC and HBBC as appropriate. Night-time working will be restricted to specific circumstances, and work internally within buildings. By arrangement, there may be some out of hours construction deliveries made to the site.

10.209. Mitigation measures may include the following provisions:

- Ensure all processes are in place to minimise noise before works begin and should ensure Best Practicable Means in accordance with the Control of Pollution Act[38] are being achieved throughout the demolition and construction programme;
- Ensure that modern plant is used, complying with the latest European Commission noise emission requirements;
- Selection of inherently quiet plant where possible;
- Use of hoarding around the area where works are being undertaken, where practicable, to assist in the screening of noise generation from low-level sources;
- Hydraulic techniques for breaking to be used in preference to percussive techniques where practical;
- Use of rotary bored rather driven piling techniques, where appropriate;
- Off-site pre-fabrication to be used, where practical;
- All plant and equipment to be used for the works to be properly maintained, silenced where appropriate, operated to prevent excessive noise and switched off when not in use;
- Plant to be certified to meet relevant current legislation as defined by BS 5228 standards;

[38] Control of Pollution Act, 1974

- All Contractors to be made familiar with current legislation and the guidance in BS 5228 (Parts 1 and 2), which should form a prerequisite of their appointment;

- Loading and unloading of vehicles, dismantling of site equipment such as scaffolding or moving equipment or materials around the site to be conducted in such a manner as to minimise noise generation and where practical to be conducted away from NSRs;

- Careful consideration should be given to planning construction traffic haul routes within the Site and along local roads close to existing sensitive receptors, so as to minimise reversing movements and to minimise the number of construction vehicles during peak traffic flows on local roads. Construction traffic will be managed by the contractor under the Construction Traffic Management Plan (CTMP); and,

- Noise complaints should be reported to the Contractor and immediately investigated.

10.210. Method statements regarding construction management, traffic management, and overall site management should be prepared in accordance with best practice and relevant British Standards, to minimise impacts of construction works. One of the key aims of such method statements is to minimise disruption to local residents and businesses during the construction phase.

10.211. Consultation and communication with the local community throughout the construction period also serves to publicise the works schedule, giving warning to residents regarding periods when higher levels of noise may occur during specific operations, and providing them with lines of communication where complaints can be addressed. Dissemination of such information is likely to encourage the community to be tolerant of short-term disturbance with potential long-term benefits of the proposals.

10.212. A Construction Environmental Management Plan (CEMP) will also be prepared and put in place to ensure best practicable measures are adopted with regards to each phase of the proposals. A framework CEMP will be submitted alongside the ES. This should also help to ensure that the noise and vibration impacts relating to construction activities are minimised.

10.213. In addition, it is recommended that the construction contractor be a member of the 'Considerate Constructors Scheme', which is an initiative open to all contractors undertaking building work.

Completed development

10.214. The unmitigated modelling and assessment work detailed above did not account for the proposed earthworks as the final levels were not determined at the time. As the scheme has progressed, the proposed earthworks have become available. Therefore, the future noise model has been updated to include the proposed earthworks and further inform the noise mitigation strategy.

Noise from HGV movements, loading/unloading operations and service yard areas, including SRFI operations

10.215. Rating levels associated with HGV movements, loading/unloading operations and service yard areas, including SRFI operations are predicted to be above the measured background noise levels for a number of NSRs, particularly during the night-time on a weekend. Therefore, further consideration has been given to mitigation measures.

10.216. Due to the height of the gantry cranes, a barrier of significant height would be required to remove line of sight to the nearest NSRs. Therefore, consideration has been given to plant selection and noise control options further in this section, to control the noise at source. In light of this, the gantry cranes and associated character correction have been removed from the following assessment.

10.217. To mitigate noise from HGV movements, loading/unloading operations and service yard areas, including SRFI operations, at receptors located to the north of the Proposed Development, a number of options have been explored. These include the location, height and extent of acoustic barriers. As a result of this, it has been identified that, dependant on location around the Site, acoustic barriers above 6m in height do not provide a significant reduction in the noise level.

10.218. In accordance with NPS for National Networks, local impacts as a result of the SRFI should be minimised and 'a good design should meet the principal objectives of the scheme by eliminating or substantially mitigating the identified problems by improving operational conditions and simultaneously minimising adverse impacts. It should also mitigate any existing adverse impacts wherever possible'. It goes onto state that 'the project should demonstrate good design through optimisation of scheme layout to minimise noise emissions and, where possible, the use of landscaping, bunds or noise barriers to reduce noise transmission. The project should also consider the need for the mitigation of impacts elsewhere on the road and rail networks that have been identified as arising from the development, according to Government policy'.

10.219. Therefore, to minimise the effect, the following are likely to be required, shown on Figure 10.6:

- a stepped acoustic barrier of between 2m and 3m in height on the northern boundary;
- a 6m high acoustic barrier adjacent to NSR9; and
- a 4m high acoustic barrier on the north-eastern boundary.

10.220. It is considered that with the proposed acoustic barriers in place, impulsive noise associated with the proposed operations close to the ground are unlikely to be perceptible. Therefore, no penalty for impulsivity has been included within the following assessment.

10.221. The barriers have been included within the noise model and the resultant levels predicted at NSRs where an adverse impact has previously been identified. Tables 10.50 through to

Table 10.53 outlines the BS 4142 assessment with the proposed mitigation in place.

Table 10.50 - Operational noise assessment, with mitigation – Weekday, daytime (0700-2300)

NSR	Description					
	Specific noise level (dB L_s)	Acoustic correction feature	Rating level (dB $L_{A,Tr}$)	Background (dB L_{A90})	Excess over background	Magnitude of impact
1	45	N/A	45	35	+10	**High**
2	45		45	35	+10	**High**
3	41		41	35	+6	**Medium**
4	44		44	35	+9	**High**
5	45		45	35	+10	**High**
6	45		45	35	+10	**High**
7	41		41	35	+6	**Medium**
8	45		45	35	+10	**High**
9	46		46	41	+5	**Medium**
10	44		44	41	+3	**Low**
11	42		42	41	+1	**Low**
24	51		51	35	+16	**High**
25	47		47	35	+12	**High**
26	46		46	35	+11	**High**

10.222. During the daytime on a weekday, with mitigation in place, noise levels associated with the operation of the SRFI are between +1 and +16 dB above the measured background noise levels during the daytime, dependent on the NSR.

10.223. The mitigated effect of operational noise associated with the SRFI is likely to be a permanent, major adverse at worst for NSRs located closest to the Proposed Development during the daytime on a weekday. For NSRs 3 and 7, the impact is predicted to be permanent, moderate adverse effect. For NSRs 9, 10 and 11, the impact is predicted to be permanent, negligible adverse effect.

Table 10.51: Operational noise assessment, with mitigation – weekday, night-time (2300-0700)

NSR	Description					
	Specific noise level (dB L_s)	Acoustic correction feature	Rating level (dB $L_{A,Tr}$)	Background (dB L_{A90})	Excess over background	Magnitude of impact
1	48	N/A	48	35*	+13	**High**

NSR	Description					
	Specific noise level (dB L_s)	Acoustic correction feature	Rating level (dB $L_{A,Tr}$)	Background (dB L_{A90})	Excess over background	Magnitude of impact
2	45		45	35*	+10	**High**
3	43		43	35*	+8	**Medium**
4	45		45	35*	+10	**High**
5	-		-	-	-	**-**
6	45		45	35*	+10	**High**
7	47		47	35*	+12	**High**
8	45		45	35*	+10	**High**
9	-		-	-	-	**-**
10	43		43	39	+4	**Medium**
11	44		44	39	+5	**Medium**
24	50		50	35*	+15	**High**
25	47		47	35*	+12	**High**
26	48		48	35*	+13	**High**

10.224. During the night-time on a weekday, with mitigation in place, noise levels associated with the operation of the SRFI are between +4 and +13 dB above the measured background noise levels during the night-time, dependent on the NSR.

10.225. The mitigated effect of operational noise associated with the SRFI is likely to be a permanent, major adverse at worst for NSRs located closest to the Proposed Development during the night-time on a weekday. For NSRs 10 and 11, the impact is predicted to be permanent, moderate adverse effect.

Table 10.52: Operational noise assessment, with mitigation – Weekend daytime (0700-2300)

NSR	Description					
	Specific noise level (dB L_s)	Acoustic correction feature	Rating level (dB $L_{A,Tr}$)	Background (dB L_{A90})	Excess over background	Magnitude of impact
1	45	N/A	45	43	+2	**Low**
2	45		45	43	+2	**Low**
3	41		41	43	-2	**Very Low**
4	44		44	43	+1	**Low**
5	45		45	43	+2	**Low**
6	45		45	43	+2	**Low**
7	41		41	43	-2	**Very Low**
8	45		45	43	+2	**Low**

NSR	Description					
	Specific noise level (dB L_s)	Acoustic correction feature	Rating level (dB $L_{A,Tr}$)	Background (dB L_{A90})	Excess over background	Magnitude of impact
9	46		46	50	-4	**Very Low**
10	44		44	50	-6	**Very Low**
11	42		42	50	-8	**Very Low**
24	51		51	43	+8	**Medium**
25	47		47	43	+4	**Medium**
26	46		46	43	+3	**Low**

10.226. During the daytime on a weekend, with mitigation in place, noise levels associated with the operation of the SRFI are between -8 and +8 dB above the measured background noise levels during the daytime, dependent on the NSR.

10.227. The mitigated effect of operational noise associated with the SRFI is likely to be a permanent, moderate adverse at worst for NSRs 24 and 25 during the daytime on a weekend. For the remaining NSRs, the impact is predicted to be permanent, negligible adverse effect.

Table 10.53: Operational noise assessment, with mitigation – Weekend, night-time (2300-0700)

NSR	Description					
	Specific noise level (dB L_s)	Acoustic correction feature	Rating level (dB $L_{A,Tr}$)	Background (dB L_{A90})	Excess over background	Magnitude of impact
1	48	N/A	48	38	+10	**High**
2	45		45	38	+7	**Medium**
3	44		44	38	+6	**Medium**
4	45		45	38	+7	**Medium**
5	-		-	-	-	**-**
6	45		45	38	+7	**Medium**
7	47		47	38	+9	**High**
8	45		45	38	+7	**Medium**
9	-		-	-	-	**-**
10	43		43	42	+1	**Low**
11	44		44	42	+2	**Low**
24	50		50	38	+12	**High**
25	47		47	38	+9	**High**
26	48		48	38	+10	**High**

10.228. During the night-time on a weekend, with mitigation in place, noise levels associated with the operation of the SRFI are between +1 and +12 dB above the measured background noise levels during the night-time, dependent on the NSR.

10.229. The mitigated effect of operational noise associated with the SRFI is likely to be a permanent, major adverse at worst for NSRs 1, 24 and 26 during the night-time on a weekend. For NSRs 2 through 4, 6 through 8 and 25, the resultant effect is predicted to be permanent, moderate adverse. For the remaining NSRs, the impact is predicted to be permanent, minor adverse effect.

10.230. As previously discussed, the impact is dependent on context, and therefore the sound rating levels have been compared to the existing noise climate at each receptor where a moderate effect or greater is predicted, for the daytime and night-time for both the weekday and weekend periods.

Table 10.54: Predicted increase in ambient noise levels with mitigation - Weekday

Increase in noise level due to operational noise from the SRFI with mitigation- Weekday								
NSR	Daytime (0700 – 2300)				Night-time (2300 – 0700)			
	Rating level	Ambient level	Rating + ambient	Increase	Rating level	Ambient level	Rating + ambient	Increase
1	45.0	61.3	61.4	**+0.1**	48.0	60.5	60.7	**+0.2**
2	45.0		61.4	**+0.1**	45.0		60.7	**+0.1**
3	41.0		61.4	**+0.0**	43.0		60.6	**+0.1**
4	44.0		61.4	**+0.1**	45.0		60.7	**+0.1**
5	45.0		61.4	**+0.1**	-		-	**N/A**
6	45.0		61.4	**+0.1**	45.0		60.6	**+0.1**
7	41.0		61.4	**+0.0**	47.0		60.7	**+0.2**
8	45.0		61.4	**+0.1**	45.0		60.6	**+0.1**
9	46.0	48.6	49.9	**+1.9**	-	46.3	-	**N/A**
10	44.0		49.9	**+1.3**	43.0		48	**+1.7**
11	42.0		49.5	**+0.9**	44.0		48.3	**+2**
24	51.0	61.3	61.6	**+0.4**	50.0	60.5	60.9	**+0.4**
25	47.0		61.5	**+0.2**	47.0		60.7	**+0.2**
26	46.0		61.4	**+0.1**	48.0		60.7	**+0.2**

Table 10.55: Predicted increase in ambient noise levels with mitigation - Weekend

Increase in noise level due to operational noise from the SRFI with mitigation- Weekend								
NSR	Daytime				Night-time			
	Rating level	Ambient level	Rating + ambient	Increase	Rating level	Ambient level	Rating + ambient	Increase
1	45.0	59.4	59.6	**+0.2**	48.0	49.9	51.7	**+2.2**
2	45.0		59.6	**+0.2**	45.0		51.4	**+1.2**
3	41.0		59.5	**+0.1**	43.0		50.9	**+0.8**
4	44.0		59.6	**+0.1**	45.0		51.4	**+1.2**
5	45.0		59.6	**+0.2**	-		-	**-**
6	45.0		59.6	**+0.2**	45.0		50.9	**+1.2**
7	41.0		59.5	**+0.1**	47.0		51.4	**+1.8**
8	45.0		59.6	**+0.2**	45.0		51.1	**+1.2**
9	46.0	52.2	52.8	**+0.9**	-	46.5	-	**-**
10	44.0		52.8	**+0.6**	43.0		48.1	**+1.6**
11	42.0		52.6	**+0.4**	44.0		48.4	**+1.9**
24	51.0	59.4	59.9	**+0.6**	50.0	49.9	53	**+3.1**
25	47.0		59.6	**+0.2**	47.0		51.4	**+1.8**
26	46.0		59.6	**+0.2**	48.0		52.1	**+2.2**

10.231. Tables 10.54 and 10.55 show that for all NSRs, the existing ambient noise levels are predicted to increase by up to 3.1dB during the weekday and weekend daytime and night-time as a result of the proposed operations of the SRFI, with mitigation in place.

10.232. Table 10.54 indicates that for the daytime period on a weekday, the increase in noise levels is predicted to be between +0.0dB and +1.9dB. For the night-time period, the increase ranges between +0.1dB and +1.7dB.

10.233. Table 10.55 indicates that for the daytime period on a weekend, the increase in noise levels is predicted to be between +0.1dB and +0.9dB. For the night-time period, the increase ranges between +0.8dB and +3.1dB.

10.234. As previously discussed, this level of change is considered marginal, and would barely be perceptible to the human ear with changes of 3dB only just perceptible under laboratory conditions. This relates to noise that is continuous and similar in nature to the existing noise, however by using the rating level, rather than the specific level accounts for this. As such, an increase of 3dB is considered to be low, which is likely to result in a permanent, minor adverse effect, when context is taken into consideration.

10.235. It is also worth noting that during the daytime, the rating levels at NSRs with the exception of NSR24, as a worst case- achieve the lower guideline value of 50dB $L_{Aeq,T}$ for garden areas in accordance with WHO guidelines and BS 8233. Furthermore, assuming a 15dB loss

through a partially opened window as per guidance contained within BS 8233, this would result in internal levels of up to 32dB $L_{Aeq,T}$. This would achieve the internal noise level criteria set out in BS 8233, when considering noise associated with the SRFI facility.

10.236. With the exception of NSR 24, the rating levels at the remainder of the receptors would only marginally exceed the recommended internal noise level in bedrooms during the night-time, assuming a 15dB loss through a partially opened window.

10.237. It is therefore considered with the implementation of acoustic barriers, as shown on Figure 10.6, and consideration to the existing noise climate, the resultant impacts at nearby NSRs will be low.

10.238. Any barrier should have a minimum surface density of 15kg/m^2 and form a continuous unbroken barrier with no gaps at the bottom. There are a range of suitable barrier solutions available that can meet this specification.

10.239. Notwithstanding the above, the exact heights and extents of the acoustic barriers are subject to final road and rail alignments and final finished levels on site. Therefore the design will continue to be revised. The exact heights and extents will be confirmed in the ES.

Gantry cranes

10.240. As previously discussed, it is recommended that careful consideration is given to the selection of the gantry cranes. The assessment has included the use of Rubber Gantry Cranes (RTG), which are diesel powered. These can be made much quieter by the implementation of suitable acoustic enclosures around the engines and a high-performance silencer on the exhaust. This specification can be included when purchasing the plant, and it is understood that noise levels can be up to 10dB quieter than has been assumed in the assessment.

10.241. Further modelling has been undertaken of the receptors identified in Tables 10.51 and 10.52, with a 10dB reduction applied to each of the crane engines and crane exhausts, and the proposed boundary mitigation in place. With all sources operating, the results indicate that the predicted noise levels at all NSRs remain unchanged (less than 1dB). The largest increase is 0.5dB at NSRs and although this increases the ambient noise level during the night-time to +3.6dB, it is considered that this is unlikely to be perceptible. Therefore, the residual effect is likely to remain at permanent, minor adverse for all receptors.

10.242. Other options include rail mounted gantry (RMG) cranes and/or hybrid cranes. RMG cranes utilise an electric engine rather than a diesel one, and a hybrid crane is powered from lithium polymer batteries. These types of cranes, which can be further supplemented by enhanced acoustic enclosures, will result in SWLs of 100dB or less. This is much lower than the one assumed within this assessment.

Assessment of operational maximum noise levels

10.243. The $L_{AF,max}$ level as a result of tug activity, reach stackers and/or cranes handling containers

has been recalculated with the proposed mitigation in place. The $L_{AF,max}$ has been calculated for those receptors where an exceedance of the criteria was predicted. The results are shown below in Tables 10.56.

Table 10.56: Predicated L_{AFmax} noise level at NSRs with mitigation

NSR	Source	Predicted external L_{AFmax}	Level above 60dB L_{AFmax} criterion
1	Container Placement	61	+1
7	Container placement	62	+2
24	Spreader impact	63	+3
	Container placement	65	+5
25	Container placement	61	+1
26	Container Placement	64	+4

10.244. The resultant L_{AFmax} levels from the operation of the SRFI are predicted to be above the adopted criteria for the NSRs, with mitigation in place. However, it is worth noting that exceedances are only predicted when the source is operating in close proximity to the receptor, and the model does not account for any screening provided by container stacks or other sources. It is therefore considered that the above presents a worst-case scenario and that for the majority of the time, the L_{AFmax} levels at the NSRs will be lower than those predicted above.

Noise from fixed plant, equipment and break-out noise

10.245. Noise limits have been derived at the nearest NSRs. Provided that these limits are achieved, the resultant effect is likely to be minor adverse at worst. Therefore, no further consideration of mitigation measures is warranted.

Noise from off-site rail movements

10.246. The increase in noise levels as a result of additional rail movements associated with the Proposed Development are predicted to result in a minor, adverse impact. Therefore, no further consideration of mitigation measures is warranted.

Vibration from off-site rail movements

10.247. Although it is not possible to state the magnitude of effect of vibration as a result of the additional train movements, it is likely that the resultant impact will be low, which will be confirmed following the detailed vibration assessment and reported on in the ES.

Off-site road traffic noise impacts

10.248. The assessment of the potential noise impact from Development generated traffic

indicates that, when considering the change in noise levels, and the resultant future noise levels at worst affected receptors, there is likely to be, at worst a permanent, major adverse effect from this noise. Therefore, the benefit of mitigation should be considered.

10.249. As the impacts are predicted for receptors that are located away from the Proposed Development, and outside the control of the project team, consideration has been given to the guidance within DMRB to mitigate noise where adverse impacts are predicted. This recommends consideration could be given to the following;

- vertical or horizontal alignment of the road;
- earth bunds to act as a noise barrier;
- noise barriers;
- low noise road surfacing;
- speed limits; and
- restrictions on noisy vehicle types.

10.250. It is acknowledged that not all of the options provided above, such as earth bunds and road alignments, are feasible due to existing constraints on the roads. However, more detailed modelling will be undertaken to determine the extent of effects and what, if any measures can be implemented to reduce these within the ES. Consideration will also be given to those options which could feasibly be implemented, to reduce noise at existing NSRs.

10.251. For receptors where a moderate adverse effect is predicted i.e links on the B4669, and the on/off slip roads associated with Junction 2, it is considered that the resultant effect would likely be permanent, minor adverse effect with proposed mitigation in place.

10.252. Although a major, adverse effect is predicted on the roundabout associated with Junction 2 of the M69, NSR14 which is the nearest receptor, is located adjacent to the M69 where noise levels are likely to be dominated by road traffic on the motorway, therefore any effect is likely to be lower than stated at this receptor.

A47 link road

10.253. Noise from road traffic on the proposed link road is predicted to result in permanent, major adverse effects at NSRs 1, 15, 19, and 20. Therefore, further consideration has been given to mitigation measures.

10.254. Although an adverse impact is not predicted at NSR19, the resultant noise contour indicates that a small area of the nature reserve would experience noise levels in excess of 55dB $L_{Aeq.16h}$. Therefore, consideration has also been given to reducing noise levels in this area.

10.255. Therefore, to minimise the effect, the following are likely to be required, shown on Figure

10.4:

- a 6m high acoustic barrier on the eastern boundary, in the south eastern part of the Main HNRFI Site;
- a 4m high acoustic barrier adjacent to the A47 link road, in the south-eastern part of the site. This has been extended to protect Freeholt Wood, where a moderate adverse effect was predicted on tranquillity;
- a 1.8m high acoustic adjacent to the A47 to protect Burbage Common; and
- bunding adjacent to the A47 link road as it passes NSR1.

10.256. The barriers have been included within the noise model and the resultant levels predicted at NSRs where an adverse impact has previously been identified. The results are shown below in Table 10.57.

Table 10.57: Resultant daytime noise levels at NSRs as a result of the A47 link road with mitigation

Receptor	Garden (1.5m) dB $L_{Aeq,16h}$	First Floor (4m) dB $L_{Aeq,16h}$	Magnitude of impact
NSR1	54	54	**Low**
NSR15	50	50[1]	**Low**
NSR19*	54	N/A	**Low**
NSR20	50	53	**Low**

[1] Calculated at ground floor level
** Based on 55dB $L_{Aeq,16h}$ in accordance with WHO and BS 8233 guidelines.*

10.257. It is therefore considered with the implementation of acoustic barriers, as shown on Figure 10.4, the resultant impacts at nearby NSRs will be low.

10.258. Any barrier should have a minimum surface density of 15kg/m^2 and form a continuous unbroken barrier with no gaps at the bottom. There are a range of suitable barrier solutions available that can meet this specification.

10.259. In addition, where barriers run parallel to each other, on opposite sides of the road, the area facing the road will need to be absorptive.

10.260. The exact heights and extents of the acoustic barriers are subject to final road alignments, and final finished levels on site.

Tranquillity

10.261. The future contribution from the Proposed Development has been predicted with the proposed mitigation in place, adjacent to the A47 link road. The results are shown below

in Table 10.58.

Table 10.58: Resultant daytime noise levels at NSRs as a result of the A47 link road, with mitigation

NSR	Daytime 16-hour period (0700 – 2300)			Resultant future noise level dB $L_{Aeq,16h}$	Change
		Existing measured level – dB $L_{Aeq,16h}$	Future contribution from Proposed Development – Calculated dB $L_{Aeq,16h}$		
Freeholt Wood	Weekend	53.2	51.2	55.3	+2.1

10.262. The resultant effect at Freeholt Woods on a weekend with mitigation in place will be permanent, negligible adverse.

10.263. As previously discussed, as the site is already surrounded by busy roads, and the background noise levels are characterised by road traffic, it is considered that the resultant noise levels will not be out of character. It is recognised that some areas of Freeholt Woods may experience noise levels above those predicted above, particularly where the woods are in close proximity to the proposed link road.

10.264. It is also worth noting that the above assessment has included cranes with the higher noise level to consider a worse-case scenario.

RESIDUAL ENVIRONMENTAL EFFECTS

Construction phase

10.265. With the proposed mitigation in place it is considered that the effects of construction noise and vibration would be reduced at existing NSRs to between temporary, minor adverse significance and temporary, moderate adverse significance at worst.

Completed development

Noise from HGV movements, loading/unloading operations and service yard areas, including SRFI operations

10.266. It is considered that with the proposed mitigation in place, and considering the context, in accordance with BS 4142, the residual effect is likely to be permanent, minor adverse.

Noise from fixed plant, equipment and break-out noise

10.267. Noise level limits were derived at the nearest NSRs. Provided that these limits are achieved, the residual effect is likely to be permanent, minor adverse at worst.

Noise from off-site rail movements

10.268. The predicted noise impact from additional rail movements indicates that there will be, at worst, a permanent, minor adverse effect at NSRs and mitigation is not required. Therefore, the residual effect remains at permanent, negligible adverse.

Vibration from off-site rail movements

10.269. Although it is not possible to state the magnitude of effect of vibration as a result of the additional train movements, it is likely that the permanent, long term residual effect will be minor adverse, which will be confirmed following the detailed vibration assessment and reported on in the ES.

Off-site road traffic noise impacts

10.270. The predicted noise impact from development generated traffic with mitigation in place, indicates that there will be between a permanent, minor adverse and permanent, moderate adverse effect at NSRs during the daytime.

10.271. During the night-time, effect is likely to remain at permanent, negligible adverse effect as a result of development generated road traffic in the short-term.

A47 link road

10.272. It is considered that with the proposed mitigation in place, the residual effect is likely to be permanent, minor adverse.

Tranquillity

10.273. With mitigation in place, and when the context is taken into account, it is considered that the change in noise level, and considering the context, the residual effect is likely to be permanent, negligible and minor adverse.

CUMULATIVE AND IN-COMBINATION EFFECTS

Construction phase

10.274. Due to the distances between the Proposed Development and the committed developments, it is considered unlikely that the cumulative effects of construction noise will be significant. A full consideration of the likely effects from the identified short list will be reported on in the ES.

Completed development

10.275. The traffic data, provided by the Transport Consultant, includes committed developments in the area. The assessment has considered the cumulative effects of road traffic at NSRs, and the assessment indicates that there will not be a significant effect.

10.276. It is understood that part of the site could be operational while the wider site is being built out. Given the distances between NSRs and the Main HNRFI Site, and that as the site is built out it will provide some screening from construction/operational noise, it is considered that the cumulative effects will be minor, adverse. This will be considered further within the final ES.

CLIMATE CHANGE

10.277. Climate change is unlikely to alter the findings of this assessment or have an adverse impact on noise in the future.

SUMMARY AND CONCLUSIONS

10.278. This assessment has considered the potential impact of noise and vibration at noise sensitive receptors (NSRs) during the construction and operational phase of the Proposed Development.

10.279. In order to define baseline noise conditions, the results of a previous noise survey undertaken by Hydrock in 2018 have been used as a basis for the assessment. Long-term unattended daytime and night-time ambient noise measurements were undertaken at four locations considered to be representative of NSRs in the vicinity of the Proposed Development.

10.280. Based upon a preliminary quantitative assessment of potential noise during the construction phase, it is considered that, at worst, temporary, major adverse effects could arise without mitigation at the nearest existing NSRs. Such impacts should be minimised where possible by adopting best practicable means through the CEMP, in order to specifically identify potential impacts and appropriate mitigation based upon site specific information as the project progresses. With appropriate mitigation in place, residual effects would be reduced to temporary, moderate adverse at worst for existing NSRs.

10.281. The effects of construction vibration will need to be managed through the CEMP, based upon specific details of the construction works required once available.

10.282. The operational phase assessment has considered noise from fixed plant, equipment and break-out noise associated with the Proposed Development, noise associated with HGV deliveries and SRFI operations to the Proposed Development site, and the change in noise levels at NSRs due to additional rail movements, the proposed A47 link road and

development generated road traffic.

10.283. For noise associated with HGV deliveries including SRFI operations, library data for HGV movements, loading/unloading activities and rail movements has been used, together with assumptions regarding operations, building layout and usage. With appropriate mitigation in place, including acoustic barriers, the residual effect would be a permanent, minor adverse at worst.

10.284. Noise level limits have been derived at the nearest NSRs for fixed plant and equipment to achieve. Provided that these limits are achieved, the resultant effect is likely to be permanent, minor adverse at worst.

10.285. The predicted noise impact from additional rail movements indicates that there will be, at worst, a permanent, minor adverse effect at NSRs and mitigation is not required.

10.286. Although it is not possible to state the magnitude of effect of vibration as a result of the additional train movements, it is likely that the resultant impact will be low, which will be confirmed following the detailed vibration assessment.

10.287. Road traffic noise associated with the proposed A47 link has been modelled based on data provided by the Transport Consultant. With appropriate mitigation in place, including acoustic barriers, the residual effect would be a permanent, minor adverse.

10.288. The results of a tranquillity assessment, which considers the change in noise levels and the absolute noise level at Burbage Common Woods, Aston Firs and Freehold Woods, indicates that there would be a permanent, minor adverse effect at worse.

Tritax Symmetry (Hinckley) Limited

HINCKLEY NATIONAL RAIL FREIGHT INTERCHANGE

Preliminary Environmental Information Report

Chapter 11: Landscape and visual effects

January 2022

This document forms a part of a Preliminary Environmental Information Report (PEIR) for the Hinckley National Rail Freight Interchange project.

A PEIR presents environmental information to assist consultees to form an informed view of the likely significant environmental effects of a proposed development and provide feedback.

This PEIR has been prepared by the project promoter, Tritax Symmetry (Hinckley) Limited. The Proposed Development is described in Chapter 3 of the PEIR and is the subject of a public consultation running from 12 January to 9 March 2022.

Details of how to respond to the public consultation are provided at the end of Chapter 1 of the PEIR and on the project website:

http://www.hinckleynrfi.co.uk/

This feedback will be taken into account by Tritax Symmetry (Hinckley) Limited in the preparation of its application for a Development Consent Order for the project.

Chapter 11 ◆ Landscape and visual effects

INTRODUCTION

11.1 This chapter sets out a preliminary assessment of the potential landscape and visual effects, potential mitigation measures and residual effects of the Proposed Development as described in Chapter 3: *Project description* of this Preliminary Environmental Information Report (PEIR). At this stage, this assessment is preliminary only and is not exhaustive; other effects and mitigation requirements might be identified in light of on-going baseline studies and survey work, stakeholder/public consultation and evolution of the project design. An Environmental Statement (ES) will be submitted with the application for the Proposed Development, and this will set out the full assessment.

11.2 The assessment is informed by a preliminary Landscape and Visual Baseline Assessment (LVA) (see Appendix 11.1), a Public Rights of Way (PRoW) Appraisal and Strategy (Appendix 11.2), a Soil and Agricultural Land Quality Report (Appendix 11.3) and an Arboricultural Impact Assessment (Appendix 11.4), which should be read in conjunction with this Chapter.

11.3 Landscape and visual effects are independent but related issues. Landscape effects relate to changes to the landscape fabric and the features contributing to the landscape character and quality. Visual effects relate to the appearance of such changes within views and the resulting effect on visual amenity.

11.4 This chapter describes the assessment methodology, the baseline conditions at the Environmental Impact Assessment (EIA) site and surroundings, the likely significant landscape and visual effects, the mitigation measures required and the likely residual effects after these measures have been employed.

11.5 This chapter should be read in conjunction with the following PEIR Appendices and other pertinent documents submitted:

- Appendix 11.1 – Landscape and Visual Baseline Report, which includes full details of survey methods, methodology and associated drawings;
- Appendix 11.2 – Public Rights of Way Appraisal and Strategy;
- Appendix 11.3 – Soils and Agricultural Land Quality Report;
- Appendix 11.4 - Arboricultural Impact Assessment
- Figure 11.1 - Site Location and Site Boundaries;
- Figure 11.2 - Environmental Planning Considerations;

- Figure 11.3 - Public Rights of Way and Informal Open Space;
- Figure 11.4 - Site Character and Context;
- Figure 11.5 - Published Landscape Character Areas;
- Figure 11.6 – Topography;
- Figure 11.7 - Zone of Theoretical Visibility of DCO Site in its Current Form;
- Figure 11.8 - Zone of Theoretical Visibility of Proposed Parameters;
- Figure 11.9 - Photoviewpoint Locations;
- Figure 11.10 – Photoviewpoints;
- Figure 11.11 - Night Photoviewpoint Locations;
- Figure 11.12 - Night Photoviewpoints;
- Figure 11.13 - Public Rights of Way Assessment;
- Figure 11.14 - Public Rights of Way Strategy;
- Figure 11.15 - Illustrative Landscape Strategy;
- Figure 11.16 – Scheme Parameters;
- Figure 11.17 – Landscape Sections;
- Figure 11.18 – Survey Observations;
- Figure 11:19 – Agricultural Land Classification;
- Figure 11:20 – Public Rights of Way Strategy: Rail Crossings;
- Figure 11:21 – Significant Visual Effects at Construction;
- Figure 11:22 – Significant Visual Effects at Year 1; and
- Figure 11:23 - Significant Visual Effects at Year 15.

METHODOLOGY AND DATA SOURCES

EIA Scoping opinion

11.6 An EIA Scoping Opinion was received from the Secretary of State in December 2020 which

included comments in relation to the Landscape Section of the Scoping Report. The scoping advice and how it has been addressed are summarised in Table 11.1.

Table 11.1: Secretary of State's comments from EIA Scoping Opinion in relation to the assessment of landscape and visual effects (December 2020).

PINS ID	Ref.	Inspectorate's comments	Response
4.5.1	n/a	No matters have been proposed to be scoped out of the assessment.	No response required.
4.5.2	10.10 – 10.19	The Scoping Report identifies the relevant policy relating to this aspect. It is noted that the consultation response from Hinckley and Bosworth Borough Council (HBBC) identifies further policy of relevance for informing the landscape assessment and proposed mitigation, such as Green Infrastructure provision.	These further policies have been considered.
4.5.3	10.22 & 10.54	The Scoping Report states that consultation with local authorities to inform the scope of the assessment has already commenced. Stakeholders should be consulted on the latest proposals and the viewpoints agreed based on the new Order Limits and height parameters. The outcomes of any discussions with statutory consultees should be documented in the ES and provide justification for the approach taken	Further consultation has taken place with all relevant parties as documented at para 11.30.
4.5.4	10.52	Note the input from Elmesthorpe Parish Council regarding open views from Station Road (not just St Mary's Church).	An additional view (Photoviewpoint 48) has been assessed from this location.

PINS ID	Ref.	Inspectorate's comments	Response
4.5.5	n/a	The landscape and visual impact assessment in the ES should include impacts during both day and night. The predicted light levels at the site and its vicinity should be clearly identified and the ES should explain any assumptions that the prediction of light levels has been based on.	A narrative will be provided within the Landscape and Visual Impact Assessment from a select number of photoviewpoint locations. The assessment will be based upon the lighting strategy that consent will be secured as a requirement of the DCO.

11.7 Consultee responses to the Applicant's 2020 EIA Scoping Report concerning the assessment of landscape and visual effects are summarised in Table 11.2 below.

Table 11.2: Consultee responses to the Applicant's 2020 EIA Scoping Report in relation to the assessment of landscape and visual effects (December 2020).

Consultee	Comments	Response
Blaby District Council	For both the construction and operational phases the effects of lighting and seasonal variations must be detailed.	A narrative will be provided within the Landscape and Visual Impact Assessment from a select number of photoviewpoint locations. This assessment would be based upon an outline Lighting Strategy that will be secured as a requirement of the DCO.
	The consideration of mitigation where significant adverse effects cannot be avoided through design should also be implemented. Consideration on its own is not sufficient.	No response required.
	The long-term management of any landscaping and planting areas	A Landscape Ecological Management Plan (LEMP) will focus on the

Consultee	Comments	Response
	along with any other retained planting must be considered.	establishment and ongoing management and maintenance of the ecological and landscape areas throughout the Proposed Development. The LEMP will be secured as a requirement of the DCO.
	Taking in to account the size and height of the development it is considered that the landscape and visual impact assessment should include photomontages of the proposed developments. The viewpoints for photomontages should be agreed with stakeholders, including local planning authorities.	A number of photomontage locations had previously been considered and agreed with consultees. This has been reviewed in light of changes to the project and resubmitted and agreed with relevant parties.
	Careful consideration should be given to the form, siting and use of materials and colours given the size of the structures. This should be in terms of minimising the adverse visual impact of them.	A design code for buildings is to be submitted to Blaby District Council (BDC) for approval and secured as a requirement of the DCO. The Design and Access Statement (DAS) also provides further detail whilst landscape buffers and tree planting will provide softening mitigation in views towards the Proposed Development. An Illustrative Landscape Strategy and illustrative Landscape Sections are provided in Figures 11.15 and 11.17.
	As there will clearly be a visual impact at night as well as day, the relationship between the effects assessed in this chapter and any chapter dealing with lighting should be clearly stated to make it clear that the full range of visual effects have been assessed.	Narrative will be provided for in the ES with regard to potential lighting impacts, based on an outline Lighting Strategy for the Proposed Development which will be secured as a requirement of the DCO.
	Given the nature, scale and	Narrative will be provided for in the ES

Consultee	Comments	Response
	operation times (24 hours, 7 days a week) of the proposed project, the inclusion of a standalone chapter on lighting within the Environmental Statement would be welcomed. Where lighting could have an impact on surrounding villages and towns these impacts should be fully explored through the EIA process and suitable mitigation included.	with regard to potential lighting impacts, based on an outline Lighting Strategy for the Proposed Development and off-site highways which will be secured as a requirement of the DCO.
Burbage Parish Council	The landform across the area is very gently rolling with localised topography influenced by small streams around settlements, which are often on localised plateaux. The land use is predominantly agricultural and primarily arable with relatively long-distance views. Buildings are low rise and blend into the landscape.	No response required.
	The Applicant has listed Landscape Designations in the area which does not include Burbage Common. The Applicant states *"no Registered Parks and Gardens lie within the 5km search area"*. This clearly shows no consideration of Burbage Common has been made. This is an important asset to the local community and should have specific safeguarding references built into the ES. Note: Burbage Common is HBBC's largest countryside site and is located on the edge of Hinckley. Great for walkers, and dog lovers alike, a mix of semi-natural woodland and unspoilt grassland is 200 acres in size. In addition, the Common is	Burbage Common is not a designated Registered Park and Garden. Burbage Common is however a Country Park and area of Open Access Land and is considered as such in this PEIR and forthcoming ES.

Consultee	Comments	Response
	well used for horses, along the trails and open landscape. There are also several paddocks and corrals along Burbage Common Road, and other livestock. The Common is immediately adjacent to the proposed site.	
	The ES should consider the impacts of light, noise and vista change upon the Common and surrounding areas and state the mitigation proposed on these impacts.	Narrative will be provided for in the ES with regard to potential lighting impacts, based on an outline Lighting Strategy for the Proposed Development which will be secured through a Requirement of the DCO. The Noise and Vibration Chapter (Chapter 10) sets out the potential effects of noise and vibration impacts associated with the construction and operation of the Proposed Development as well as mitigation measures. These have been considered within the PEIR and will be considered in the full ES. This PEIR Chapter considers the vistas from a number of locations within Burbage Common and are detailed within the PEIR assessment and full ES.
	The ES should consider the impacts on horse riding in the immediate area around the proposed development.	A Public Rights of Way Appraisal and Strategy (Appendix 11.2) considers the condition, usage and impact upon the bridleway network as well as a strategy for improvements to the network.
	The ES should ensure Burbage Parish Council is involved in the visual assessment process and determining appropriate viewpoints in addition to those	Consultation has been undertaken with Leicestershire County Council's (LCC) and Hinckley and Bosworth Borough Council (HBBC) upon the location of agreed Photoviewpoints.

Consultee	Comments	Response
	listed in the Scoping Report.	
	It is noted in the Scoping Document that the Applicant may propose diversion of footpaths and rights of way running across the development site. Some of these diversions may be via underpasses.	No response required.
	The ES should include an assessment of the impact on amenity value of footpath diversions, and will include provision for the assessment of risks to pedestrians using such routes.	A number of photoviewpoints are taken from PRoW within and surrounding the Main Hinckley National Rail Freight Interchange (HNRFI) Site and broad study area. The effects upon these in visual terms will be considered in the assessment.
Hinckley and Bosworth Borough Council (HBBC)	Although lighting is mentioned in the landscape and visual effects section of the report no detail is provided of how this will be assessed for the operational use. A methodology for the assessment of lighting should be submitted and agreed. Lighting during the construction may be controlled under a Construction Environmental Management Plan (CEMP).	Narrative will be provided for in the ES with regard to potential lighting impacts, based on an outline Lighting Strategy for the Proposed Development which will be secured as a requirement of the DCO. Lighting for construction will be controlled via an outline Construction Environmental Management Plan (outline CEMP) that will be secured as a requirement of the DCO.
	The Scoping Report identifies the relevant policy and legislation relating to landscape and visual effects. Policy 20 of the HBBC Core Strategy provides the overarching strategy for the provision and enhancement of green infrastructure in the borough. The application site partially lies within the Southern Green Infrastructure Zone. The Borough Council has	The Hinckley and Bosworth Green Infrastructure Strategy (May 2020) has been considered.

Consultee	Comments	Response
	published an updated Green Infrastructure Strategy (May 2020) which will inform the preparation of the new Local Plan. The Strategy includes a range of interventions and opportunities for GI provision within the Southern GI Zone which could contribute towards enhancement and mitigation opportunities including enhancing the Southern Green Wedge, delivering a more resilient Burbage Common and Woods Sites of Special Scientific Interest (SSSI) and increased woodland planting.	
	The Scoping Report has regard to the relevant policies of the HBBC Local Plan and Landscape Character Assessment, however, regard should also be given to relevant spatial objectives of the Core Strategy including SO7 Healthier Active Communities, SO10 Natural Environment and Cultural Assets and SO12 Climate Change and Resource Efficiency. To inform the landscape assessment and proposed mitigation, regard should also be given to the following studies: • Hinckley/Barwell/Earl Shilton/Burbage Green Wedge Review April 2020. Landscape Sensitivity Assessment 2017	These policies and documents have/will be considered in the PEIR and forthcoming ES.
Historic England	We have the following specific comments to make regarding the Scoping Report 'Landscape and	There has been and will continue to be a close working relationship between landscape and heritage disciplines In

Consultee	Comments	Response
	Visual Effects' chapter: Historic England considers it essential that heritage considerations are included in the proposed scope of the 'Landscape and Visual Effects' chapter to ensure that the results can be integrated with those of the 'Cultural Heritage' chapter. We recommend that indicative wireframes/photomontages are produced for key viewpoints where significant heritage assets are affected which should include: any views towards heritage assets in which development would be visible; views from designated heritage assets; and views between contemporaneous or otherwise associated heritage assets in which both assets and any proposed development would be visible. Viewpoints should not, in our opinion, be limited to areas and routes with public access. We recommend that any proposed list of viewpoints is reviewed with these considerations in mind. Recommendation: Historic England urges your authority to address the issues set out above with the Applicant to ensure that the EIA will provide a sound basis on which to assess the significance of any heritage assets affected and the effect on significance of the impacts of the proposed scheme. A sound EIA report is the basis on which to	the HNRFI project team. Cross-referencing between chapters will be provided in the forthcoming ES. Photoviewpoint and photomontages locations have been reviewed and agreed between both disciplines and consulted with each respective relevant consultees.

Consultee	Comments	Response
	identify (and where possible avoid, minimise or mitigate) what may be substantial direct and indirect impacts on assets of local, regional and national importance.	
Leicestershire County Council	We can confirm that having studied the documents in detail, the Landscape and Visual Effects section adequately and thoroughly covers the Main site as referred to on page 15 of the document. Furthermore, we are pleased to see that this updated document includes assessment of additional viewpoints recommended by LCC in 2018.	No response required.
	We do however note that the DCO Order limits now appear to include an eastern and western arm to the development which was not previously identified in the 2018 documents; we understand that these areas are to be considered as part of this exercise and as such we would expect a full, further investigation of this wider site including the eastern and western arm and including an assessment of a number of additional viewpoints.	Photoviewpoint and photomontages locations have been reviewed and agreed with LCC.
Natural England	Natural England would wish to see details of local landscape character areas mapped at a scale appropriate to the development site as well as any relevant management plans or strategies pertaining to the area. The EIA should include assessments of	A plan of published landscape character areas covering the draft DCO Order Limits is contained within Figure 11.5. The PEIR includes an assessment of potential significant effects on landscape and visual amenity.

Consultee	Comments	Response
	visual effects on the surrounding area and landscape together with any physical effects of the development, such as changes in topography. The European Landscape Convention places a duty on Local Planning Authorities (LPA) to consider the impacts of landscape when exercising their functions.	
	The EIA should include a full assessment of the potential impacts of the development on local landscape character using landscape assessment methodologies. We encourage the use of Landscape Character Assessment, based on the good practice guidelines produced jointly by the Landscape Institute and Institute of Environmental Assessment in 2013. The Landscape Character Assessment provides a sound basis for guiding, informing and understanding the ability of any location to accommodate change and to make positive proposals for conserving, enhancing or regenerating character, as detailed proposals are developed.	The PEIR and forthcoming ES is undertaken in accordance with industry best practice including the *Guidelines for Landscape and Visual Impact Assessment, 3rd Edition* (GLVIA3) as produced by the Landscape Institute (LI) and Institute for Environmental Management and Assessment (IEMA).
	Natural England supports the publication *Guidelines for Landscape and Visual Impact Assessment*, produced by the Landscape Institute and the Institute of Environmental Assessment and Management in 2013 (3rd edition). The methodology set out is almost	No response required.

Consultee	Comments	Response
	universally used for landscape and visual impact assessment.	
	In order to foster high quality development that respects, maintains, or enhances, local landscape character and distinctiveness, Natural England encourages all new development to consider the character and distinctiveness of the area, with the siting and design of the proposed development reflecting local design characteristics and, wherever possible, using local materials. The EIA process should detail the measures to be taken to ensure the building design will be of a high standard, as well as detail of layout alternatives together with justification of the selected option in terms of landscape impact and benefit.	A design code for buildings is to be submitted to BDC for approval and secured as a requirement of the DCO. The DAS also provides further detail whilst landscape buffers and tree planting will provide softening mitigation in views towards the Proposed Development. An Illustrative Landscape Strategy and illustrative Landscape Sections are provided in Figures 11.15 and 11.17.
	The assessment should also include the cumulative effect of the development with other relevant existing or proposed developments in the area. In this context Natural England advises that the cumulative impact assessment should include other proposals currently at Scoping stage. Due to the overlapping timescale of their progress through the planning system, cumulative impact of the proposed development with those proposals currently at Scoping stage would be likely to be a material consideration at the time of determination of the planning	This PEIR sets out in brief how cumulative sites and effects will be dealt with in the forthcoming ES taking into account PINS Advice Note 17.

Consultee	Comments	Response
	application.	
	The assessment should refer to the relevant National Character Areas which can be found on our website. Links for Landscape Character Assessment at a local level are also available on the same page.	National Character Areas have been considered within the Landscape and Visual Baseline (Appendix 11.1), PEIR and forthcoming ES.
	Natural England encourages any proposal to incorporate measures to help encourage people to access the countryside for quiet enjoyment. Measures such as reinstating existing footpaths together with the creation of new footpaths and bridleways are to be encouraged. Links to other green networks and, where appropriate, urban fringe areas should also be explored to help promote the creation of wider green infrastructure. Relevant aspects of local authority green infrastructure strategies should be incorporated where appropriate.	A Public Rights of Way Appraisal and Strategy (Appendix 11.2) has been progressed and considers the condition, usage and impact upon the PRoW network as well as a strategy for improvements to the network.
	The EIA should consider potential impacts on access land, public open land, rights of way and coastal access routes in the vicinity of the development. Appropriate mitigation measures should be incorporated for any adverse impacts. We also recommend reference to the relevant Right of Way Improvement Plans (ROWIP) to identify public rights of way within or adjacent to the proposed site that should be maintained or	A Public Rights of Way Appraisal and Strategy (Appendix 11.2) has been progressed and considers the condition, usage and impact upon the PRoW network as well as a strategy for improvements to the network. This document considers the relevant ROWIPs pertinent to the draft DCO Order Limits. Coastal access routes are not relevant to the site. In terms of visual amenity, a number of

Consultee	Comments	Response
	enhanced.	photoviewpoints are taken from relevant PRoW, areas of Open Access Land and areas of public open space. These are considered within this PEIR and forthcoming ES.
Sharnford Parish Council	The HNRFI site will be surrounded by a landscape buffer. How will this hide a 36-metre-high building?	It has never been the intention to entirely hide the Proposed Development. Landscape buffers and tree planting will provide softening mitigation in views towards the Proposed Development. An Illustrative Landscape Strategy and illustrative Landscape Sections are provided in Figures 11.15 and 11.17.
Stoney Stanton Parish Council	Section 10.4 states *"It does not consider potential effects as a consequence of development within the Order Limit boundary encompassing junction 21 of the M1 motorway"*. The development within the Order Limit boundary will be the main issue with regards to Landscape and Visual effect. Earlier in the document it stated that B8 buildings will be some 33m in height, and the rail terminal will cover a significant area. If this is not taken into account then the section is pointless as this will be a major Landscape and visual effect.	No works are proposed at junction 21 of the M1 motorway.
	Section 10.12 refers to local planning policy, it only refers to Blaby District, and as the development is on the border of Hinckley and Bosworth Council and indeed some of the proposed development runs through it, this should also be considered.	Hinckley and Bosworth Planning Policy is considered in the Landscape and Visual baseline (Appendix 11.1) of this PEIR and the forthcoming ES.

Consultee	Comments	Response
	Section 10.23 states *"… the main site does not fall within any national or local landscape designation"* is a true statement, however it fails to mention that there would be a hard border with a designated ancient woodland, Burbage Common Country park and other areas that are designated as such. The appearance of this proposed development should take this into consideration given the extensive use of Burbage Common and Woodland as an 'escape' for many people in the area and indeed the only green space for recreational purposes in the vicinity.	The adjacent Ancient Woodland is considered within the Landscape and Visual baseline (Appendix 11.1) of this PEIR and the forthcoming ES.
	Section 10.32 states *"…in very good to excellent weather conditions*" to use this to form a representative view of the area, visits need to be undertaken in all weather conditions and in all seasons to form a representative view.	Winter condition views represent the worst-case scenario, when vegetation is not in leaf and intervisibility as a result is at its greatest.
	Section 1.52 states *"In the wider landscape there will be opportunities for partial views of the proposed development from roads"* Given the proposal to build 36m high B8 buildings on a landscape that is predominantly flat, the B8 buildings will become the significant view from many areas and dwarf any natural or manmade features. The section needs to include that the proposed site will detract from the natural	No response required.

Consultee	Comments	Response
	beauty of the Burbage Common and associated ancient woodland.	
	Section 10.52 needs to specify that Burbage Common Road is a single track road, unsuitable for HGV's with passing places, the description in this section leads to a vision of a main road that is used extensively.	No response required.
	Section 10.54 needs to reassess the other affected areas as a further increase of 6m to the height of these B8 buildings will mean there are other sensitive visual receptors. To complete the assessment using a different criteria should not be considered as appropriate.	An updated Zone of Theoretic Visibility plan (ZTV – see Figure 11.8) has been produced based on updated development parameters.
	Section 10.59 states *"Where likely significant adverse effects cannot be avoided through design, additional mitigation measures will be considered."* This statement needs to read *"…additional mitigation measures will be implemented".*	No response required.
	Section 10.61 only considers the impact to the immediate area, and not that to the wider areas (within 2.5km) that will also have significant detrimental detraction from the proposed development and should be considered.	Effects are considered within this PEIR and forthcoming ES chapter and relevant appendices.
	Section 10.104 *"opportunities exist to improve and enhance the*	Likely significant impacts are being assessed through the EIA process, using

Consultee	Comments	Response
	structure of the landscape across the area" this statement is an opinion and is contradictory to that in 10.102 where it is noted that *"development of the site in the manner proposed would alter the character of the landscape"*. However, the proposed development is summed up in a positive manner the true impact to the local area (5km) needs to be fully understood and agreed with all affected parties.	an approved methodology.

Assessment methodology and significance criteria

11.7 Provided within this section is an abridged methodology for the LVIA. An unabridged version can be found within Appendix 11.1, along with a glossary of terms used within the assessment.

11.8 The assessment methodology for assessing landscape and visual effects is based on the following best practice guidance:

- *Guidelines for Landscape and Visual Impact Assessment – Third Edition* (LI/IEMA, 2013);
- *An Approach to Landscape Character Assessment* (NE, 2014); and
- Landscape Institute Technical Guidance Note 06/19 *Visual Representation of Development Proposals* (17 September 2019).

11.9 Other reference documents used to understand the baseline position in landscape terms comprise published landscape character assessments appropriate to the DCO Site's location and the nature of the Proposed Development.

11.10 The nature of landscape and visual assessment requires both objective analysis and subjective professional judgement. Accordingly, the assessment will be based on the best practice guidance listed above, information and data analysis techniques, including mapping the predicted zone of visual effects using Geographic Information Systems, whilst photoviewpoint locations are consulted and agreed with LPAs. It uses quantifiable factors wherever possible and subjective professional judgement where necessary, and is based on clearly defined terms (see Glossary, Appendix 11.1: Annex 4.0).

Assessment methodology

11.11 The tables within Technical Appendix 11.1, Annex 1.0 offer a template for assessing the overall sensitivity of any landscape or visual receptor, as determined by combining judgements of their susceptibility to the type of change or development proposed and the value attached to the landscape or view as set out at paragraph 5.38 of GLVIA 3rd Edition (2013).

11.12 However, the assessment of overall sensitivity can change on a case-by-case basis. For example, a high susceptibility to change and a low value would result in a medium overall sensitivity, unless it can be demonstrated that the receptor is unusually susceptible or is in some particular way more valuable. A degree of professional judgment applies in arriving at the overall sensitivity for both landscape and visual receptors.

Significance of effect

11.13 The purpose of the EIA process is to identify the likely significant environmental effects (both beneficial and adverse) of development proposals. Schedule 4 to the Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 ('2017 EIA Regulations) specifies the information to be included in all environmental statements, which should include a description of:

'The likely significant effects of the development on the environment, which should cover the direct effects and any indirect, secondary, cumulative, short, medium and long-term, permanent and temporary, positive and negative effects of the development.'

11.14 To consider the likely significance of any effect, the sensitivity of each receptor is combined with the predicted magnitude of change to determine the significance of effect, with reference also made to the geographical extent, duration and reversibility of the effect within the assessment. Having taken such a wide range of factors into account when assessing sensitivity and magnitude at each receptor, the significance of effect can be derived by combining the sensitivity and magnitude in accordance with the matrix in Table 11.3.

11.15 The parameters identified for the evaluation of effects follows recommendations for the assessment of visual effects in guidance published by *NatureScot*[1] (previously Scottish Natural Heritage), and is commonly used by landscape practitioners throughout the UK. It states that:

'The matrix of three classes on each axis producing 9 cells, only 3 of which are typically judged as significant, is in our view simplistic and unrefined and quite unsuitable as a tool for widespread use. In particular it implies a degree of certainty about a very restricted definition of significance that we do not believe is justified. Expanding a 3 x 3 (9 cells) matrix to 4 x 4 (16 cells) or even 5 x 5 (25 cells) is much more representative of the diversity of size

[1] Scottish Natural Heritage (2002) *Visual Assessment of Windfarms Best Practice,* Scottish Natural Heritage Commissioned Report F01AA303A

and sensitivity found in visual impact assessment.'

Table 11.3: Level of effects matrix.

Overall Sensitivity	**Overall Magnitude of Change**				
	Very High	**High**	**Medium**	**Low**	**Very Low**
Very High	**Substantial**	**Major**	**Major/-Moderate**	**Moderate**	Moderate/-Minor
High	**Major**	**Major/-Moderate**	**Moderate**	Moderate/-Minor	Minor
Medium	**Major/-Moderate**	**Moderate**	Moderate/-Minor	Minor	Minor/-Negligible
Low	**Moderate**	Moderate/-Minor	Minor	Minor/-Negligible	Negligible
Very Low	Moderate/-Minor	Minor	Minor/-Negligible	Negligible	Negligible/-None

11.16 Each effect is described and evaluated individually through the combination of all of the relevant factors and assessed as either significant or not significant. For landscape and visual effects, those effects identified at a substantial, major, major/moderate or moderate level (bold type within matrix above) are generally considered to be significant and those effects assessed at a moderate/minor, minor, minor/negligible or negligible level are considered to be insignificant.

11.17 In certain cases, where additional factors may arise, a further degree of professional judgement may be applied when determining whether the overall change in the view will be significant or not and, where this occurs, this is explained in the assessment.

Cumulative effects

11.18 Cumulative effects generally occur where there might be simultaneous or sequential visibility of two or more developments of the same type and scale, or where the

consideration of other schemes would increase an effect identified. Where other similar schemes are in the planning system and made known to the Applicant, or are under construction, these are considered in conjunction with the Proposed Development. PINS Advice Note 17: Cumulative effects assessment relevant to nationally significant infrastructure projects (PINS, 2015c) will be taken into account in identifying cumulative schemes.

11.19 Those cumulative development sites within the near vicinity of the Proposed Development (see Figure 20.1), which have the potential to result in cumulative landscape and visual effects, will be assessed against the likely LVIA effects of the Proposed Development to determine whether cumulative effects are likely and if so their significance. This will be reported in the ES.

Field surveys

11.20 Field assessments of local site circumstances, including a photographic survey of the character and visual context of the development site and its surroundings, have been undertaken between December 2017 and April 2021 in order to gather robust baseline information. Field assessments were undertaken in accordance with best practice guidance that states that such assessments should be undertaken across the seasons to allow for the variation in effects arising from the change in leaf cover between summer and winter. Although field visits were undertaken across the seasons, the vast majority of Photoviewpoints were taken in winter conditions when the leaves are absent from the majority of trees/vegetation and visibility is at its greatest.

11.21 These field-based assessments were undertaken by qualified landscape architects, during good weather conditions.

Study areas

11.22 As a result of baseline analysis, together with an understanding of the nature and scale of the development, and the likely extent and distribution of effects, the assessment defines the following study areas, as represented on Figure 11.1:

- Broad Study Area – set at 5km distance from the Main HNRFI Site (providing the broad geographical context); and
- Detailed study area – set at 2km from the Main HNRFI Site (the area within which any significant effects are likely to fall).

11.23 A broad study area of 5km was adopted, as shown in Figure 11.1, enabling the geographical scope of the assessment to be defined and to provide the wider geographical context of the study. The search focussed on the local planning policy context, national and local landscape and other associated designations (e.g. Areas of Outstanding Natural Beauty (AONB), historic parks and gardens) and a general geographical understanding of the site and its broader context (for example, in relation to landform, transport routes and the distribution and nature of settlement). The rationale for the above study areas has

been consulted upon and accepted by LCC and HBBC.

11.24 Following initial analysis and subsequent field work, and having an appreciation of the development proposed, a refinement of the study area has been undertaken that focuses on those areas and features that are likely to be affected by the proposals. A Zone of Theoretical Visibility for the parameters of the Main HNRFI Site was produced across the 5km study area to aid understanding of the potential geographical extent of visual effects and help define a more detailed study area. The extent of this detailed study area is 2km from the Main HNRFI Site, although occasional reference may be made to features beyond this area where appropriate. This detailed study area is illustrated on Figure 11.1.

11.25 With regard to the off-site highways works, given the limited nature of many components of the intended works and the pre-existing transport character purpose they occupy (i.e., existing roads, signs, railway infrastructure etc.), these will be considered on a case-by-case basis in terms of their potential for significant adverse effects on landscape character and visual amenity through the LVA.

Limitations and assumptions

11.26 Baseline conditions have been established using existing assessments, available documentation and field assessment; it is important to note that these baseline conditions might change between submission of the application for the Proposed Development and before or during the construction of the Proposed Development. This could be, for example, because of other developments going ahead that are currently unknown.

11.27 Within reasonable limits, the assessment is undertaken in consideration of the 'worst case' scenario for the development, i.e. those potential outcomes, situations or location that would result in the most elevated effect on landscape and visual receptors. It therefore identifies the greatest degree of change likely to accrue and may be subject to mitigating factors or alternative conditions that might reduce those effects. For example, visual effects are considered in both a summer and winter context; although the magnitude of change and effect is expressed for winter landscape conditions when trees are bare of leaf cover and the visibility of development would be at its greatest. Where this is the case, the assessment identifies alternative conditions or further mitigation which might result in impacts being less pronounced.

11.28 The assessment will apply a pre-determined methodology to arrive at conclusions. This procedure brings a degree of objective, procedural rigor into what otherwise might be judged to be 'personal opinion'. Professional judgement still plays its part, but the purpose of adopting a methodology is to make the process as clear and logical as possible.

11.29 This assessment will be undertaken with regard to the phases of the Proposed Development described in PEIR Chapter 3: *Project description*, and the assumed build rate therein. An Illustrative Landscape Strategy Document will be submitted with the DCO application, illustrating the approach to green infrastructure within the Proposed Development and describing proposed planting, access and rights of way, habitat creation and outdoor amenity provisions within open areas. This will be accompanied by an

appropriate management plan to be agreed by all parties. For the purposes of the PEIR, an illustrative Landscape Strategy Plan and Illustrative Sections are contained at Figures 11.15 and 11.16.

CONSULTATIONS

Consultation meetings and correspondence

11.30 Comments received from the Pre-Application Community Consultation in 2018 and Highways Consultation in 2019 have been considered in the production of this PEIR. A limited number of concerns were raised during these consultation exercises in respect of the impact of the Proposed Development on Landscape and Visual Amenity and PRoW within and around the DCO Site. Accordingly, it is considered that these potential impacts are fully addressed in the PEIR.

11.31 In addition to the consultee comments received on the 2020 Scoping Response (Table 11.2) various consultees were engaged regarding the following documents below in Table 11.4.

Table 11.4: Summary of engagement with consultees on landscape and visual considerations.

Consultee	Document consulted upon
Blaby District Council	• Agricultural Land Classification (ALC). • Landscape Baseline. • Public Rights of Way Appraisal and Strategy. • Arboricultural Impact Assessment.
Hinckley and Bosworth Borough Council	• Agricultural Land Classification (ALC). • Landscape Baseline. • Public Rights of Way Appraisal and Strategy. • Arboricultural Impact Assessment.
Leicestershire County Council	• Landscape Baseline.

Consultee	Document consulted upon
	• Public Rights of Way Appraisal and Strategy. • Arboricultural Impact Assessment.
British Horse Society	• Public Rights of Way Appraisal and Strategy.
Elmesthorpe Parish Council	• Public Rights of Way Appraisal and Strategy.
Sapcote Parish Council	• Public Rights of Way Appraisal and Strategy.
Leicestershire Footpath Association	• Public Rights of Way Appraisal and Strategy.
Leicestershire and Rutland Bridleways Association	• Public Rights of Way Appraisal and Strategy.
Leicestershire Local Access Forum	• Public Rights of Way Appraisal and Strategy.

11.32 The EIA process has also been informed by further consultation with HBBC Case Officer and LCC Landscape Architect (advisor to BDC) in January – February 2019 and again in January 2021 in order to agree the photoviewpoint selection and methodology. A summary of recent (2021) correspondence is summarised below:

Hinckley and Bosworth Borough Council

- 18.01.21 – Email correspondence to HBBC to discuss additional photoviewpoint locations for western A47 link and potential of Eastern Village Link and Junction 21 (the latter two no longer required);
- 18.01.21 – Email response from HBBC. New landscape contact now dealing with this site;
- 29.01.21 – Email correspondence from EDP to HBBC, on photoviewpoint consultation;
- 29.01.21 – Email response from HBBC, requesting one further photoviewpoint location (Photoviewpoint 56);
- 03.02.21 – Email correspondence from EDP to HBBC, querying viewpoint location; and

- 05.02.21 – Email response from HBBC with accurate viewpoint location given.

11.33 Consultation was also held with HBBC Senior Green Space Officer in order to discuss the proximity of the Proposed Development and Burbage Common and Woods Country Park.

Leicestershire County Council

- 18.01.21 – Email correspondence to LCC to discuss additional photoviewpoint locations for western A47 link and potential of Eastern Village Link and Junction 21 (the latter two no longer required);
- 18.01.21 – Email response from LCC confirming receipt and intention to review; and
- 28.01.21 – Email response from LCC Landscape and Heritage officers confirming agreement on photoviewpoint locations and additional suggested locations.

11.34 In terms of the PRoW network across the DCO Order Limits, including those at Barwell, Earl Shilton, Thorney Fields Farm (modification B8), Elmesthorpe and Outwoods (modification HB4) railway crossings, the PRoW officer at LCC has been consulted with. Recent correspondence includes:

- 26.02.21 - Telephone correspondence with PRoW officer at LCC to discuss potential blocking back of rail/PRoW crossings and alternative options;
- 26.02.21 - Follow up email to PRoW officer at LCC to confirm matters discussed;
- 22.06.21 – Latest PRoW Strategy issued to LCC PRoW officer by email; and
- 19.07.21 – No issues raised by LCC PRoW officer on intended strategy. Recommendations made by LCC on widths and construction of PRoW.

RELEVANT LAW, POLICY AND GUIDANCE

Legislative and policy context

European Landscape Convention 2007

11.35 The European Landscape Convention (ELC), which was signed by the UK in February 2006 and became binding in 2007, is the first international treaty to focus specifically on landscape issues and aims to protect and manage landscapes in Europe and to plan positively for change within them. The ELC highlights the importance of developing landscape policies dedicated to the protection, management and creation of landscapes, and establishing procedures for the general public and other stakeholders to participate in policy creation and implementation.

11.36 The ELC defines landscape as *'an area, as perceived by people, whose character is the result*

of the action and interaction of natural and/or human factors' (Council of Europe, 2004).

11.37 The ELC is a convention of the Council of Europe, not the European Union (EU). Therefore, the United Kingdom's (UK) exit from the EU does not affect the status of this convention, and as of 31 January 2020, the UK remains a signatory.

Hedgerow Regulations 1997 SI No.1160

11.38 The Hedgerow Regulations 1997 (SI No.1160) aim to protect hedgerows, which play an important role in supporting and enhancing biodiversity, as well as defining the character of the English and Welsh countryside.

11.39 According to the regulations, a hedgerow is important if it has existed for 30 years or more, and it satisfies various wildlife, landscape or historical criteria specified in the regulations.

Policy framework

National Policy Statement for National Networks (2014)

11.40 The National Policy Statement for National Networks, hereafter referred to as the 'NPS', sets out the need for, and government's policies to deliver Nationally Significant Infrastructure Projects (NSIPs) on the national road and rail networks in England. It is the primary statement of policy for promoters of NSIPs on the road and rail networks and forms the basis for the examination by the Examining Authority and decisions by the Secretary of State. As Proposed Development includes transport and highways infrastructure, regard has been had to relevant policy in the NPS for National Networks, including but not limited to:

- Environmental and social impacts (NPS paragraphs 3.2-3.5);
- Criteria for '*good design'* for national network infrastructure (NPS paragraphs 4.28-4.35);
- Climate change adaptation (NPS paragraphs 4.36-4.47);
- Landscape and visual impacts (NPS paragraphs 5.143-5.161); and
- Land use including open space, green infrastructure and Green Belt (NPS paragraphs 5.162-5.185).

11.41 The landscape and visual effects of national networks projects are considered on pages 75-79 of the National Networks NPS. In paragraphs 5.144 – 5.146 the NPS states:

'Where the development is subject to EIA the applicant should undertake an assessment of any likely significant landscape and visual impacts in the environmental impact assessment and describe these in the environmental assessment. A number of guides have been

produced to assist in addressing landscape issues[2]*. The landscape and visual assessment should include reference to any landscape character assessment and associated studies, as a means of assessing landscape impacts relevant to the proposed project. The applicant's assessment should also take account of any relevant policies based on these assessments in local development documents in England.*

The applicant's assessment should include any significant effects during construction of the project and/or the significant effects of the completed development and its operation on landscape components and landscape character (including historic landscape characterisation).

The assessment should include the visibility and conspicuousness of the project during construction and of the presence and operation of the project and potential impacts on views and visual amenity. This should include any noise and light pollution effects, including on local amenity, tranquillity and nature conservation.'

11.42 In terms of NSIP development in areas that are not subject to a national landscape designation such as Areas of Outstanding Natural Beauty or National Parks, the NPS states at para 5.156-5.157:

'Outside nationally designated areas, there are local landscapes that may be highly valued locally and protected by local designation. Where a local development document in England has policies based on landscape character assessment, these should be given particular consideration. However, local landscape designations should not be used in themselves as reasons to refuse consent, as this may unduly restrict acceptable development.

In taking decisions, the Secretary of State should consider whether the project has been designed carefully, taking account of environmental effects on the landscape and siting, operational and other relevant constraints, to avoid adverse effects on landscape or to minimise harm to the landscape, including by reasonable mitigation.'

National Planning Policy Framework 2021 (NPPF)

11.43 At the heart of the National Planning Policy Framework (NPPF) is a presumption in favour of sustainable development, this being the key principle running throughout the document and the development of NPPF policies. Considering this broad aim alongside the three dimensions of sustainable development, in particular that relating to environmental matters, the role of LVIA is key in the creation of successful places in which to live and work.

11.44 For landscape, this means recognising the intrinsic beauty of the countryside (NPPF paragraph 174) and balancing any 'harm' to the landscape resource with the benefits of the scheme in other respects.

[2] *Guidelines for Landscape and Visual Impact Assessment*, 3rd Edition, April 2013. Natural England publishes profiles for National Character Areas.

11.45 With regards to statutory landscape designations, paragraph 176 - 177 states that:

'Great weight should be given to conserving and enhancing landscape and scenic beauty in National Parks, the Broads and Areas of Outstanding Natural Beauty which have the highest status of protection in relation to these issues. The conservation and enhancement of wildlife and cultural heritage are also important considerations in these areas, and should be given great weight in National Parks and the Broads. The scale and extent of development within all these designated areas should be limited, while development within their setting should be sensitively located and designed to avoid or minimise adverse impacts on the designated areas.'

11.46 No part of the draft DCO Order Limits falls within or adjacent to the above specified statutory landscape designations nor are any located within the broad study area.

11.47 In consideration of landscape and visual impacts of light pollution, paragraph 185 bullet point (c) states that new development should *'limit the impact of light pollution from artificial light on local amenity, intrinsically dark landscapes and nature conservation'*.

Local planning policy

11.48 The DCO Order Limits fall primarily across two LPA areas: Blaby District and Hinckley and Bosworth Borough. The relevant adopted local statutory planning documents include:

- Blaby District Local Plan (Core Strategy) (adopted 2013);
- Blaby District Local Plan (Delivery) Development Plan Document (adopted 2019);
- Hinckley and Bosworth Borough Core Strategy (adopted 2009); and
- Hinckley and Bosworth Borough Site Allocations and Development Management Policies (adopted 2016).

11.49 The 'Cross In Hand' roundabout (ref: Junction HR1) of the DCO Order Limits falls on the boundary of Rugby Borough Council (RBC) and Harborough District Council (HDC). The relevant adopted local statutory planning documents include:

- Rugby Local Plan 2011 – 2031 (adopted 2019); and
- Harborough Local Plan 2011 – 2031 (adopted 2019).

11.50 The limited nature of the works required to Junction HR1 are unlikely to result in the potential for significant landscape or visual effects and as such, no further review of local planning policy has been undertaken.

Supplementary planning documents

11.51 The following additional supplementary guidance is relevant in terms of understanding landscape character across both the Blaby and Hinckley and Bosworth LPA areas:

- Blaby District Landscape and Settlement Character Assessment (2020);
- Hinckley/Barwell/Earl Shilton/Burbage Green Wedge Review April (2020);
- Hinckley and Bosworth Landscape Sensitivity Assessment (2017);
- Landscape Character Assessment for Hinckley and Bosworth (2017);
- Hinckley and Bosworth Green Infrastructure Strategy (2020);
- Harborough District Landscape Character Assessment (2007); and
- Landscape Assessment of the Borough of Rugby (2006).

Table 11.5: Summary of relevant planning policy concerning landscape and visual amenity

Policy	Summary of policy requirement	Response to policy
Blaby District Local Plan (Core Strategy) 2013		
Policy CS2 – Design of New Development	*'In order to secure a high quality environment, all new development should respect distinctive local character and should contribute to creating places of a high architectural and urban design quality, contributing to a better quality of life for the local community.'*	High quality landscape design and potential mitigation measures have been identified to contribute to policy objectives, which have been reflected through a combination of the: • Design and Access Statement; • Parameter Plans; • Illustrative Masterplan; • Illustrative Landscape Masterplan (Figure 11.15); and • Landscape Sections (Figure 11.17).

Policy	Summary of policy requirement	Response to policy
Policy CS14 – Green Infrastructure (GI);	*'Blaby District Council and its partners will seek to protect existing, and provide new, networks of multi-functional green spaces'. This network will comprise public and privately owned land. Green Infrastructure can include formal open spaces for sport and recreation, green areas that can be used for informal recreation, areas that are valuable for their biodiversity (flora and fauna and network links), areas that are of cultural importance (heritage assets and their settings), areas that maintain natural and ecological processes (such as floodplains) and other areas that contribute to the health and quality of life of communities.'*	A design code for buildings is to be submitted to BDC for approval and secured as a requirement of the DCO. The DAS also provides further detail whilst landscape buffers and tree planting will provide softening mitigation in views towards the Proposed Development. An Illustrative Landscape Strategy and illustrative Landscape Sections are provided in Figures 11.15 and 11.17.
Policy CS18 – Countryside;	*'Land will be designated as Countryside where it is outside the limits to built development and outside designated Green Wedges and Areas of Separation.* *Within areas designated as Countryside, planning permission will not be granted for built development, or other development which would have a significantly adverse effect on the appearance or character of the landscape.'*	The Proposed Development will have significant adverse effects on the local landscape character. Potential mitigation measures have been identified through initial design and secondary measures (such as planting and green infrastructure to reduce effects as illustrated within the Illustrative Landscape Strategy (Figure 11.15).
Blaby District Local Plan (Delivery) Development Plan Document (2019)		
Policy DM2 – Countryside	This policy largely echoes Policy CS18 of the Blaby District Local Plan (Core Strategy).	Potential mitigation measures have been identified, with regard to a review of published documentation

Policy	Summary of policy requirement	Response to policy
	In consideration of landscape, the policy further adds: a) *'The development is in keeping with the appearance and character of the existing landscape, development form and buildings. Decisions in respect of impact on landscape character and appearance will be informed by the Blaby Landscape and Settlement.* *Character Assessment, Leicestershire and Rutland Historic Landscape Characterisation Study, National Character Areas and any subsequent pieces of evidence; and* b) *The development provides a satisfactory relationship with nearby uses that would not be significantly detrimental to the amenities enjoyed by the existing or new occupiers,* *including but not limited to, consideration of:* i. *overdevelopment of the site due to factors including footprint, scale and mass;* ii. *privacy, light, noise, disturbance and overbearing effect; and* iii. *vibration, emissions, hours of working, vehicular activity.'*	(Appendix 11.1), through initial design and secondary measures (such as planting and green infrastructure to reduce effects (Figure 11.15 and 11.17). Green Infrastructure within the proposed development will be designed to integrate with the wider landscape context (Figure 11.15).
Hinckley and Bosworth Core Strategy (adopted 2009)		
Policy 6 – Hinckley/Barwell/Earl	The Green Wedge overlaps with a small portion of the DCO Order	Potential mitigation measures have been identified through

Policy	Summary of policy requirement	Response to policy
Shilton/Burbage Green Wedge	Limits. The Policy safeguards the area from development. Any development that does take place within, should retain the function of the Green Wedge, retain and create green networks between the countryside and open spaces within urban areas, retain and enhance public access to the Green Wedge, especially for recreation and it should retain the visual appearance of the area.	initial design and secondary measures (such as planting and green infrastructure) to reduce effects.
Policy 20 – Green Infrastructure	The Proposed Development partially lies within the Southern GI Zone. The 2020 Green Infrastructure Strategy includes a range of interventions and opportunities for GI provision within the Southern GI Zone which could contribute towards enhancement and mitigation opportunities including enhancing the Southern Green Wedge, delivering a more resilient Burbage Common and Woods SSSI and increased woodland planting.	These GI measures are considered in the design and mitigation of the Proposed Development. The Illustrative Landscape Strategy (Figure 11.15)
Hinckley and Bosworth Borough Site Allocations and Development Management Policies (adopted 2016)		
Policy DM4 – Safeguarding the Countryside and Settlement Separation	Policy seeks to protect intrinsic value, beauty, open character and landscape character, the countryside by safeguarding it from unsustainable development.	High quality design and potential mitigation measures have been identified to contribute to policy objectives.

Policy	Summary of policy requirement	Response to policy
Policy DM9 – Safeguarding Natural and Semi-Natural Open Spaces	Policy states that: *'All developments within or affecting Natural and Semi-Natural Open Spaces should seek to retain and enhance the accessibility of the space and its recreational value whilst ensuring the biodiversity and conservation value is also enhanced.'*	The Proposed Development responds to adjacent assets such as Burbage Common and Woods Country Park and PRoW with regard to accessibility, biodiversity and conservation value. As illustrated within Figure 11.15, the areas adjacent to Burbage Common and Woods Country Park will be safeguarded from development through the conversion to naturalistic, biodiverse areas of public open space.

BASELINE CONDITIONS

11.52 A general description of land and surrounding area of the Proposed Development is provided in Chapter 2: *Site description* of this PEIR.

Landscape designations

11.53 As illustrated in Figure 11.2 and of relevance here with regard to landscape value, no part of the DCO Order Limits lies within a nationally or regionally designated landscape. The closest designated Area of Outstanding Natural Beauty (AONB) to the Main HNRFI Site is the Cannock Chase AONB, 43 km to the north-west. The closest designated National Park is the Peak District, 60 km to the north-north-west.

Landscape character

11.54 Published landscape character assessments provide a helpful understanding of the area and the landscape context for the DCO Order Limits, with character assessments having been undertaken from the national level down to more localised regional assessments.

11.55 At the national level, the DCO Order Limits lies within National Character Area (NCA) 94 'Leicestershire Vales'. The key characteristics are broadly described as follows:

- *'An open landscape of gentle clay ridges and valleys underlain by Mercia Mudstone and Lias groups bedrock but with an extensive cover of superficial deposits*

occasionally giving rise to moderately steep scarp slopes. There is an overall visual uniformity to the landscape and settlement pattern;

- *Land use characterised by a mixture of pasture and arable agriculture that has developed on the neutral clay soils;*
- *Distinctive river valley of the Soar and Swift, with flat flood plains and gravel terraces together with tributaries including the Sence. Riverside meadows and waterside trees and shrubs are common, along with waterbodies resulting from gravel extraction;*
- *Woodland character derived largely from spinneys and copses on the ridges and the more undulating land and from waterside and hedgerow trees and hedgerows. The density, height and pattern of hedgerows varies throughout;*
- *Diverse levels of tranquillity associated with contrasts between busy urban areas and some deeply rural parts. Large settlements dominate the open character of the landscape. Leicester, Lutterworth, Hinckley and Market Harborough and related infrastructure, including major roads are often visually dominant;*
- *Frequent small towns and large villages often characterised by red brick buildings and attractive stone buildings in older village centres and eastern towns and villages;*
- *Frequent, imposing spired churches are also characteristic, together with fine examples of individual historic buildings; and*
- *Rich and varied historic landscape, with the nationally important Bosworth Battlefield near Sutton Cheney, prominent historic parklands and country houses, ridge-and furrow earthworks and important medieval settlement remains, for example at Wistow Hall, Gumley, Knaptoft and Peatling Magna.'*

11.56 While the key characteristics of the NCA are broadly representative of the wider landscape, for the scale of the development proposed, it is considered that the description of landscape character undertaken at the sub-regional level is more relevant in establishing the landscape resource baseline. Accordingly, while NCA 94 has been used to inform this LVA, it will not be carried forward to the detailed assessment of effects, with the focus being on local landscape character areas.

11.57 The following subsections identify the county and borough published landscape character areas within the near vicinity of the Project Site, whilst a more detailed narrative is included in the LVA Baseline (Appendix 11.1). Figure 11.5 illustrates the location of Landscape Character Areas (LCAs) in relation to the DCO Order Limits.

Blaby Landscape and Settlement Character Assessment (2020)

11.58 A review of the Blaby District Council Landscape and Settlement Character Assessment (BDCLCA) finds that the DCO Order Limits fall across five Landscape Character Areas (LCA) within the Blaby District. As illustrated in Figure 11.5, the northern parts of the Main HNRFI Site and most of the A47 Link lie in LCA 6: 'Elmesthorpe Floodplain'.

11.59 The southern portions of the Main HNRFI Site, M69 Junction 2 fall within LCA 1: 'Aston Flamville Wooded Farmland'.

11.60 The majority of off-site highway modifications east of the Main HNRFI Site and M69 are located within LCA 15: 'Stoney Stanton Rolling Farmland', save for one isolated off-site highway modification works (B5) at Coventry Road/Croft Road junction c.920m east of Croft. This is located partially within LCA 5: 'Croft Hill and Quarries' and partially within LCA 3: 'Cosby Agricultural Parkland'.

11.61 A summary of which elements are located within each BDCLCA LCA is provided below in Table 11.6.

Table 11.6: HNRFI project components locations within BDCLCA LCAs.

LCA	**HNRFI component**
LCA1: Aston Flamville Wooded Farmland	Main HNRFI, A47 Link Road
LCA 3: Cosby Agricultural Parkland	Highways modification B5
LCA 5: Croft Hill and Quarries	Highways modification B5
LCA6: Elmesthorpe Floodplain	Main HNRFI Site and A47 Link Road
LCA 5: Stoney Stanton Rolling Farmland	Modifications B2, B3, B4, B6, B8 and M69 Junction 2.

Hinckley and Bosworth Landscape Character Assessment (2017)

11.62 Within the Hinckley and Bosworth District Council Landscape Character Assessment (HBBCLCA) one LCA, 'Burbage Common Rolling Farmland' covers the north-western end of the A47 Link Road and highways modification HB2 and HB3.

11.63 The A47/Ashby Road highways modification (ref: HB1) and the Outwoods (HB4) railway crossing is located within the Urban Character Area (UCA) 4: Hinckley.

11.64 A summary of which elements are located within each HBCDLCA LCA is provided below in Table 11.7.

Table 11.7: HNRFI project components within HBBCLCA LCAs.

LCA	HNRFI component
LCA1: Burbage Common Rolling Farmland	A47 Link Road, M69 Junction 2, Outwoods railway crossing HB4
UCA 4: Hinckley	Highways modification HB1, Outwoods railway crossing HB4

11.65 The above character areas are reviewed further in Section 3 of Technical Appendix 11.1.

Rugby Landscape Character Assessment (2006)

11.66 Within the Rugby Borough Council Landscape Character Assessment (RBCLCA), highways modification HR1 falls within the 'High Cross Plateau, Open Plateau'.

Harborough Landscape Character Assessment (2007)

11.67 Within the Harborough District Council Landscape Character Assessment (HDCLCA), highways modification HR1 falls within the 'Upper Soar'.

Landscape character of the Main HNRFI Site

11.68 While the above assessments provide a helpful contextual appreciation of the wider landscape, none provide a sufficiently site-specific assessment to allow a reliable assessment to be made of the effects of the Main HNRFI Site on the landscape. In particular, published assessments tend to miss more localised influences on the landscape, such as the effect of traffic or existing development on tranquillity and visual character, especially in close proximity to settlements. This requires an appropriately detailed assessment of the Main HNRFI Site and its immediate surroundings, which has been undertaken, and is described below.

11.69 Site visits have taken place between 2015 and 2021 in good to excellent weather conditions. The visits were complemented by a review of aerial photography, mapping and field assessments from publicly accessible locations (e.g. from local roads and PRoW).

11.70 The (approximately) 225.57 hectares (ha) Main HNRFI Site is located approximately 5km to the north-east of Hinckley town centre, in a level area of mixed farmland to the north-west of M69 junction 2 as illustrated in Figure 11.1. The Main HNRFI Site lies between the Felixstowe to Nuneaton railway to the north-west and the M69 motorway to the south-east, with the village of Elmesthorpe to the north. The DCO Site also includes Junction 2

of the M69 motorway and extends south-westwards along the motorway to accommodate proposed junction upgrade works.

Soil types

11.71 The underlying mudstone bedrock across Main HNRFI Site has an influence both on soil profiles and drainage with a large part of the site comprising *'slowly permeable seasonally wet slightly acid but base-rich loamy and clayey soils'*[3], whist some small areas in the north of the site comprise 'slightly acid loamy and clayey soils with impeded drainage', which have impeded to slightly impeded drainage down to the mudstone aquifer below.

11.72 The Soils and Agricultural Quality Report (Appendix 11.3) confirms that the Main HNRFI is underlain by heavy clay loam topsoils that directly overlie slowly permeable clay subsoils. A small area in the north-east of the Main HNRFI Site has lighter permeable upper layers (see Figure 11.19). The heavy soils provide land of subgrade 3b agricultural quality (83% of the site) and the lighter soils provide subgrade 3a land (1% of the site); all the land is limited by wetness. The remaining 16% comprises non-agricultural land.

Vegetation and hydrological features

11.73 The current land use of the Main HNRFI Site is predominantly arable farmland, comprising medium to small, enclosed field parcels, typically bounded with mature hedgerows with few hedgerow trees. Also included within the site are a number of small to medium Improved Grassland field and few Poor Semi-improved Grassland. Areas of amenity grassland are extremely limited and located adjacent to dwellings only.

11.74 Along part of the eastern edge of the Main HNRFI Site to the southern extent of the Main HNRFI Site are limited areas of Semi-improved Neutral Grassland forming the motorway verge. In addition, there is a small strip of Broadleaved Semi-natural Woodland and an area of Broadleaved Plantation Woodland near the footbridge over the M69 (halfway along the eastern boundary of the Main HNRFI) and within the M69 junction 2 roundabout is an area of Broad-leaved Plantation Woodland. A number of Broadleaved Scattered/Parkland Trees are located within the site, along the B4669 Hinckley Road to the west of Junction 2 and southward along the M69. Another group of Broadleaved Scattered/Parkland Trees runs alongside the Hinckley to Leicester Railway along the north-western boundary of the Main HNRFI site.

11.75 As mentioned in the previous section, there is no Ancient Woodland within the Main HNRFI Site. However, there are several blocks of Ancient Woodland close to the south-western edge of the Main HNRFI Site, at Burbage Wood, Aston Firs, Freeholt Wood and Sheepy Wood. Two other areas of Ancient Woodland are located within the 5km study area of the main site, with Kirkby Spinney located c.3.8km to the north-west of the site and Crab-tree Spinney located c.3km to the south of the Main HNRFI. In terms of other veteran trees, one was identified across the Main HNRFI Site (T486) and is located near

[3] http://www.landis.org.uk/soilscapes/index.cfm

Hobbs Hayes.

11.76 Small areas of dense scrub are located near Hobbs Hayes and Woodhouse Farm whilst a larger portion is located between the access track to Hobbs Hayes and the M69 Junction 2 roundabout. A thin strip of scattered scrub is present along most of the boundary with the Hinckley to Leicester railway.

11.77 A survey compliant with BS5837:2012 *Trees in Relation to Design, Demolition and Construction* of the trees within the footprint of the Main HNRFI Site has been undertaken. The survey was undertaken by an appropriately qualified arboriculturalist in May 2018 and updated in October 2021 to check previously surveyed items and include any new trees within the DCO Order Limits. The survey recorded a total of 200 individual trees, 104 groups of trees and 193 hedgerows and 9 woodlands totalling 506 items. Of these 506 items, 13 have been categorised as A, of high quality and value; 148 have been categorised as B, of moderate quality; and 260 have been categorised as C, of low quality. In addition, 85 items have been categorised as U and due to their impaired condition are considered unsuitable for retention, irrespective of development.

11.78 Hydrological features comprise nine field ponds scattered over the Main HNRFI Site, one unnamed stream corridor that passes from Freeholt Wood south of the Main HNRFI Site, which travels in a north-eastern direction to the eastern boundary and M69, and few dry ditches.

Historic landscape and features

11.79 The Leicestershire Historic Landscape Characterisation data for the Main HNRFI Site is available via the Leicestershire archaeology data service and identifies that the area containing the Main HNRFI Site is formed part of areas HLE5028 (reorganised piecemeal enclosure), HLE5123 (planned enclosure), HLE5026 (piecemeal enclosure), HLE5119 (very large post-war fields), HLE5027 (major road junction) and HLE5029 (farm complex). As such the historic landscape of the Main HNRFI Site was created predominantly as a result of parliamentary enclosure of the 18th century (of which a number of internal field boundaries reflect this pattern of enclosure), which has experienced subsequent reorganisation in 19th and 20th centuries.

11.80 The Heritage Chapter (Chapter 13) identifies that within the fields north of Woodhouse Farm and in a field to the south of Freeholt Lodge were identified as representing reduced ridge and furrow earthworks which highlights the long term agricultural character and land use of the Main HNRFI Site since at least medieval times. At the time of the visits the Main HNRFI Site was generally under pasture.

11.81 Ancient Woodland bounds the Main HNRFI Site to the south-west and provides a dense vertical natural feature which forms a backdrop to the agricultural land within the Main HNRFI Site.

Built features

11.82 Major road infrastructure included within the Main HNRFI Site includes the M69 motorway, which runs along the eastern site boundary to the southern tip of the Main HNRFI Site. The M69 Junction 2 roundabout, a short section of the B4669, two bridges (Aston Lane and Lychgate Lane), and one footbridge over the M69 are also included within the Main Order Limits. A short section of the B4668 is also included in the draft Order Limits to facilitate the A47 Link Road connection to the Main HNRFI Site.

11.83 Burbage Common Road is the principal road running through the Main HNRFI Site and provides access to properties and farm buildings located on the main site, which are mainly centred around Woodhouse Farm located centrally within the Main HNRFI Site.

11.84 A separate access road off the B4669 provides access to Freeholt Lodge and Hobbs Hayes within the southern portion of the Main HNRFI Site. There is a mobile home park and a separate gypsy and traveller settlement off Smithy Lane to the south of the proposed Main HNRFI Site, west of M69 junction 2.

11.85 Separating the main body of the Main HNRFI Site and the A47 Link is a section of the Leicester to Hinckley railway and a bridge that allows Burbage Common Road from within the Main HNRFI Site to pass over the railway towards Burbage Common and Woods Country Park.

11.86 Buildings on the Main HNRFI Site itself include the dwellings of Woodhouse Farm, Old Woodhouse Farm, Woodfield, The Weeping Willows, Hobbs Hayes Farm and Freeholt Lodge. In addition to these are a number of ancillary agricultural structures that form farm complexes around Woodhouse Farm and Hobbs Hayes.

Sensory and perceptual elements

11.87 As noted above, the underlying vale character of land surrounding the Main HNRFI Site forms an expansive generally flat to gently undulating landscape. As such, distant visibility can be limited due to subtle variation in topography and by mature vegetation within the landscape or built form forming settlements. From within the Main HNRFI Site, a number of telecommunications masts can be seen, appearing in relatively close proximity to the east of the site and pass over the Main HNRFI Site towards its southern extent and appear as visual detractors within the landscape. The eastern boundary of the Main HNRFI Site is formed by the M69, of which traffic movements, along with trains passing along the Leicester to Hinckley railway line, exert an urbanising influence over areas adjacent to these features and into the area of the Main HNRFI site, due to the noise and negative effect this causes on the tranquillity.

A47 Link Road

11.88 The A47 Link Road includes a corridor of land extending north-westwards across the railway from the edge of the Main HNRFI Site to the B4668/A47 Leicester Road.

Soil types

11.89 The land forming the area south of the A47 Link is Mercia Mudstone overlain by Bosworth Clay Member (clay and silt). The National Soil Map records this land as within the Salop Association, comprising slowly permeable seasonally waterlogged reddish fine loamy over clayey soils. These soils are typically imperfectly to poorly draining and give land limited by wetness restrictions. This land is likely to be of poorer agricultural quality, subgrade 3b, in line with the land already surveyed.

Vegetation and hydrological features

11.90 The current land use of the A47 Link Road corridor is predominantly arable farmland, comprising medium to small, enclosed field parcels, typically bounded with managed low-lying hedgerows with occasional hedgerow trees. Field margins are typically scrubby. This area of the A47 Link Road corridor cuts across four arable fields and hedgerow boundaries, with the southern edge formed by hedgerow aligning Burbage Common Road.

Historic landscape and features

11.91 The historic landscape of the A47 Link Road corridor is similarly a result of parliamentary enclosure of the 18th century, which has experienced subsequent reorganisation in 19th and 20th centuries and of no more than low sensitivity.

11.92 Two veteran trees (T835 and T854) are located centrally, halfway along the A47 Link Road corridor just north of the Burbage Common eastern car park.

Built features

11.93 Built features within the A47 Link Road corridor comprise Burbage Common Road which runs along its southern edge, the B4688 at the north-western end and the bridge over the railway from the Main HNRFI Site to the A47 Link Road. Otherwise, there are no other built features within the A47 Link part of the DCO Order Limits.

Sensory and perceptual elements

11.94 As in the Main HNRFI Site, the underlying vale character forms an expansive generally flat to gently undulating landscape. As such, distant visibility can be limited due to subtle variation in topography and by mature vegetation within the landscape or along transport routes such as the B4688 / A47 Leicester Road. From within this area, land rises eastwards towards the Leicester to Hinckley railway that provides an urbanising influence when trains pass. Bridge Farm is also located in this direction and comprises a large farm complex on elevated ground overlooking the area between the railway and the B4468/A47 Leicester Road to the north-west. The B4668/A47 cannot be seen but can be heard as vehicles travel at speed. Burbage Common Road which bounds this area to the south, whilst a rural lane, is relatively busy with walkers, horse riders and cars visiting the Burbage Common and Wood Country Park to the south. Whilst there are some influences from nearby roads and rail networks, the area is relatively tranquil with floodplain extending

northwards to Elmesthorpe and the Country Park located to the south.

Off-site highways and junctions

11.95 The vast majority of the areas concerning the highway modifications relate to existing transport links, which by their nature are unremarkable and all of typical highways character including hardstanding, road markings, signage, pavements and verges, with occasional mature vegetation at their edges such as trees, hedgerows and scrub.

Visual amenity baseline

11.96 To inform the Study Area for the consideration of Landscape and Visual effects, two Zone of Theoretical Visibility (ZTV) plans have been prepared. The ZTVs have been generated in a Geographical Information System (GIS), using surface and landform data only and does not account other landscape features that might limit the extent of theoretical visibility, such as vegetation and buildings. The ZTVs are based on:

- the Main HNRFI Site in its current form. See Figure 11.7; and
- the Main HNRFI Site with Proposed Development at the height parameters (see Figure 11.8).

11.97 The ZTVs illustrate the theoretical visibility based on a 5m digital terrain model (DTM) data, assuming excellent visibility with no atmospheric attenuation.

11.98 As Figure 11.8 demonstrates, the visual influence of the Main HNRFI Site will increase with development. The visual assessment process determines the extent of the increase in visual influence as well as the magnitude of any visual effects that arise.

11.99 Open views of the Main HNRFI Site are largely limited to those from roads and PRoW as they pass through the main HNRFI Site, although roadside vegetation provides some interruption and the speed and nature of travel limit the availability of views.

11.100 Following site visits, the main determinants/observations of visibility across the area towards the Main HNRFI Site are as follows (Photoviewpoints are illustrated in Figure 11.10):

- *North:* Views from the north are limited to the B581 Station Road in Elmesthorpe and built development along it. Beyond, a combination of gently undulating topography, mature vegetation and built form generally combines to limit inter-visibility. There are a couple of areas of secondary visibility towards Huit Farm (Photoviewpoint 34) and along minor road Thurlaston Lane (Photoviewpoint 27);
- *East:* Inter-visibility with the Main HNRFI Site is limited due to gently undulating topography, coupled with mature vegetation that enclose small to medium field parcels. These combine to screen views from the east, with views primarily limited to the B4669 Hinckley Road (Photoviewpoint 10) and the PRoW network within 1km from Bridleways V29/4, V29/5, V29/6, V29/9 and V29/10, as well as Footpaths U53/2

(Photoviewpoints 9 and 35) and V49/1. Further east there will be more distant secondary areas of visibility between Stoney Stanton (Photoviewpoint 22) and Fields Farm (Photoviewpoint 24), and also at the elevated geographical outlier of Croft Hill (Photoviewpoint 30);

- *South:* There are few views of the Main HNRFI Site from the south due to the intervening presence of Aston Firs, Burbage Wood and Freeholt Wood. Views will be primarily limited to the M69 Motorway as it approaches the Main HNRFI Site and the proposed M69 improvements proposed for the scheme. There may be areas of secondary visibility from isolated, elevated locations such as at Lychgate Lane bridge, which passes over the M69 c.260m south (Photoviewpoint 13), Footpath U63/1 just east of Burbage (Photoviewpoint 14), High Cross c.4.5km to the south (Photoviewpoint 32) and the B578 Lutterworth Road c.3km to the south (Photoviewpoint 33); and

- *West:* Views are generally limited by mature vegetation within and on the periphery of Burbage Common and Woods Country Park. Similarly, mature vegetation forming field boundaries and alongside roads limits visibility from this direction to Burbage Common Road and the PRoW network within 1km to the west. These routes include Bridleway U52/9 and U52/10 and Footpaths V23/1, V23/2, U50/1 and U50/3. Secondary areas of visibility include those from elevated positions at the edge of the Settlement of Barwell to the north-west of the Main HNRFI Site (Photoviewpoints 25 and 26).

11.101 Figure 11.8 includes the locations of 56 representative views that have been identified in the ZTV of the Proposed Parameters of the Main HNRFI Site and agreed through consultation. These views are at locations where there are likely to be sensitive visual receptors, including receptors on PRoW and at residential properties. These views form the basis of the visual assessment, the significance of any effect being assessed in terms of the magnitude of change in the view and the sensitivity of the visual receptor. The location of these views is set out in the Table 11.8. In keeping with good practice, the proposed photoviewpoints, including accurate visual representation (AVR) photoviewpoints and night-time viewpoints have been agreed with HBBC and LCC with those requested additionally noted in Table 11.8 below. The locations of agreed AVR and night-time photoviewpoint locations are illustrated on Figure 11.9 and 11.11 respectively. The baseline Photoviewpoints themselves are illustrated in Figure 11.10, with night-time views contained within Figure 11.12.

Table 11.8: Summary of representative photoviewpoints. (The following acronyms correspond to additional form of presentation: AVR = Photomontage; NV = Night View).

PVP. No.	Location	Grid Reference	Distance	Borough, Parish	Reason(s) for Selection
1	View from PRoW V35/1	445931, 294327	0m	Blaby, Elmesthorpe	Users of PRoW V35/1 on site.
2	View from PRoW U50/1	445541, 294322	0m	Blaby, Elmesthorpe	Users of PRoW U50/1 on site.
3	View from PRoW U52/6	445273, 294532	0m	Blaby, Elmesthorpe	Users of PRoW U52/6 on site.
4	View from PRoW U52/8/ Burbage Common Road Bridge over railway	445490, 295018	0m	Blaby, Elmesthorpe	Users of PRoW U52/8 and minor road on site.
5	View from PRoW V23/1 over railway	445795, 295229	0m	Blaby, Elmesthorpe	Users of PRoW V23/1; Boundary views from the north; Indication of potential view from passing trains.
6	View from PRoW U50/3	446049, 295455	0m	Blaby, Elmesthorpe	Users of PRoW U50/3, Close-range views from the north.

PVP. No.	Location	Grid Reference	Distance	Borough, Parish	Reason(s) for Selection
7	View from Burbage Common Road	447000, 295513	0m	Blaby, Elmesthorpe	Users of Burbage Common Road; Close-range views from the north-east.
8	View from PRoW V29/6 footbridge over M69	446831, 294576	0m	Blaby, Sapcote	Users of PRoW V29/6; Boundary views from the east.
9 (NV)	View from PRoW U53/2	446959, 294270	232m	Blaby, Sapcote	Users of PRoW U53/2; Close-range views from the east.
10	View from Hinckley Road	446990, 293816	0m	Blaby, Sapcote	Users of Hinckley Road to the west; Medium-range views from the east.
11	View from PRoW V29/3	446766, 293563	240m	Blaby, Sapcote	Users of PRoW V29/3; Close-range views from the south-east.
12 (NV) (AVR)	View from M69 overbridge on Aston Lane	445956, 292970	0m	Blaby, Aston Flamville	Users of Aston Lane; Boundary views from the south.

PVP. No.	Location	Grid Reference	Distance	Borough, Parish	Reason(s) for Selection
13	View from M69 overbridge on Lychgate Lane	445549, 292368	70m	Blaby, Aston Flamville	Users of Lychgate Lane; Medium-range views from the south.
14	View from PRoW U63/1	444775, 292714	758m	Hinckley and Bosworth, Burbage	Users of PRoW U63/1; Long-range views from the south-west.
15	View from Burbage Common	444806, 295219	854m	Hinckley and Bosworth, No Parish	Users of Open Access Land/Common Land; Medium-range views from the west.
16 (AVR)	View from Burbage Common Road	445111, 295184	0m	Blaby, Elmesthorpe	Users of Burbage Common Road; Close range views from the west.
17 (AVR)	View from PRoW U52/9	445695, 295561	250m	Blaby, Elmesthorpe	Users of PRoW U52/9; Medium range views from the north-west.

PVP. No.	Location	Grid Reference	Distance	Borough, Parish	Reason(s) for Selection
18	View from PRoW U52/11	445944, 296096	565m	Blaby, Elmesthorpe	Users of PRoW U52/11; Medium range views from the north.
19 (NV) (AVR)	View from churchyard of St Mary, Elmesthorpe	446072, 296493	880m	Blaby, Elmesthorpe	Users of the church; Long range views from the north.
20 (NV) (AVR)	View from M69 overbridge on B581	447422, 295559	120m	Blaby, Elmesthorpe	Users of B581; Close-range views from the north-east.
21	View from Station Road/PRoW V29/10	447795, 295400	390m	Blaby, Elmesthorpe	Users of PRoW V29/10; Users of Station Road; Medium range views from the east.
22 (NV) (AVR)	View from PRoW V49/2, Stoney Stanton	448373, 294333	0m	Blaby, Stoney Stanton	Users of PRoW V49/2; Long-range views from the east.

PVP. No.	Location	Grid Reference	Distance	Borough, Parish	Reason(s) for Selection
23	View from Hinckley Road, west of Sapcote	448150, 293561	0m	Blaby, Sapcote	Users of Hinckley Road; Long range views from the south east.
24 (NV) (AVR)	View from PRoW V34/2	447482, 293450	235m	Blaby, Sapcote	Users of PRoW V34/2; Medium range views from the south-east.
25 (NV) (AVR)	View from churchyard of St Mary, Barwell	444419, 296483	630m	Hinckley and Bosworth, Barwell	Users of church; Long range views from the north-west.
26	View from Shilton Road, Barwell	444976, 296984	743m	Hinckley and Bosworth, Barwell	Users of Shilton Road; Long range views from the north-west.
27	View from Thurlastone Lane	448762, 297854	2.4km	Hinckley and Bosworth, Earl Shilton	Users of Thurlastone Lane; Long range views from the north.

PVP. No.	Location	Grid Reference	Distance	Borough, Parish	Reason(s) for Selection
28	View from M69 overbridge on Pingle Lane	449418, 296985	2.2km	Blaby, Potters Marston	Users of Pingle Lane; Long range views from the north-east.
29	View from PRoW U18/1	450132, 296404	2km	Blaby, Potters Marston	Users of PRoW U18/1; Long range views from the north-east;
30 (AVR)	View from Croft Hill	450996, 296600	2.8km	Blaby, Croft	Users of Open Access Land; Long range views from an elevated location.
31	View from Coventry Road	447308, 290682	2.4km	Blaby, Sharnford	Users of Coventry Road; Long range views from the south.
32 (PM)	View from Bumblebee Lane, High Cross	447367, 288686	4km	Blaby, Sharnford	Users of Bumblebee Lane; Long range views from the south.
33	View from B578, Lutterworth Road	445152, 290073	1.7km	Hinckley and Bosworth, Burbage	Users of Lutterworth Road; Long range views from the south.

PVP. No.	Location	Grid Reference	Distance	Borough, Parish	Reason(s) for Selection
34	View from PRoW U18/4 near Huit Farm	447471, 447753	1.1km	Blaby, Earl Shilton	Users of PRoW U18/4; Long range views from the north-east.
35	View from PRoW V48/2	447471, 294040	268m	Blaby, Sapcote	Users of PRoW V48/2; Medium range views from the south-east.
36 (NV)	View from Smenell Field	445210, 294340	165m	Blaby, Elmesthorpe	Requested by HBBC 17/01/19. Users of Country Park. Close range views from the west.
37	View from Footpath V29/7	446452, 294165	0m	Blaby, Sapcote	Requested by LCC 06/02/2019. Users of PRoW. Close range views within the site.
38	View from Mill Lane	447959, 297666	2km	Hinckley and Bosworth, Earl Shilton	Requested by LCC 06/02/2019. Road and PRoW users. Mid distance views from the north.

PVP. No.	Location	Grid Reference	Distance	Borough, Parish	Reason(s) for Selection
39	View north of Church Farm	446249, 292804	217m	Blaby, Aston Flamville	Requested by LCC 06/02/2019. Users of PRoW. Mid-range views to from east of the site.
40	View from Weaver Springs Sports Park	447106, 297637	1.7km	Hinckley and Bosworth, Earl Shilton	Requested by LCC 06/02/2019. Users of recreation ground. Residential receptors. Mid-range views from the north.
41 (NV)	View from Hinckley Golf Course	444136, 294563	953m	Hinckley and Bosworth, No Parish	Requested by HBBC 17/01/19. PRoW users; golfers. Mid distant views from the west.
42	View from South of Wood House Farm	444902, 294540	189m	Hinckley and Bosworth, Burbage	Requested by HBBC 17/01/19. Users of Country Park and PRoW users. Close range views from the west.
43	View from northern edge of Burbage Common and Woods Country Park	445092, 295136	83m	Blaby, Elmesthorpe	Requested by HBBC 17/01/19. Users of Country Park. Close range views from the west.

PVP. No.	Location	Grid Reference	Distance	Borough, Parish	Reason(s) for Selection
44	View from eastern edge of Burbage Common and Woods Country Park	445348, 294976	270m	Blaby, Elmesthorpe	Requested by HBBC 17/01/19. Users of Country Park. Close range views from the west.
45	View north along B4688	444636, 295470	126m	Hinckley and Bosworth, No Parish	Users of B4688, close range north to A47 link.
46	View from Footpath V23/2 and B4688	445052, 296062	0m	Hinckley and Bosworth, Barwell	Users of PRoW and B4688, close range views south to A47 link.
47	View from Footpath V23/2 west of Billington Rough	445566, 295688	314m	Blaby, Elmesthorpe	Requested by Elmesthorpe Parish Council and Planning Inspectorate. Location moved south due to new build development blocking views on B581. Close range views to south and east.

PVP. No.	Location	Grid Reference	Distance	Borough, Parish	Reason(s) for Selection
48	View from B581 / The Roundhills	446893, 296030	178m	Blaby, Elmesthorpe	Requested by Elmesthorpe Parish Council and Planning Inspectorate. Residents of Elmesthorpe. Close range views to the south.
56	A47 / Leicester Road Roundabout	445375, 296410	1.1km	Hinckley and Bosworth, Barwell	Requested by HBBC 29/01/21. Users of A47, mid-views south to Main HNRFI Site.

Future baseline

11.102 It is anticipated that, in the absence of development, the land contained within the Main Order Limits would continue to be managed as mainly agricultural land, farmsteads and transport routes. Depending on the management regime, the quality of the landscape structure might erode, leading to further losses of valued trees and hedgerows. Alternatively, enhanced hedgerow and field boundary management might promote the biodiversity of these features perhaps with the benefit of grants.

11.103 Such variations are unlikely to be significant and would be considered as standard fluctuations. It is near-certain that the existing baseline described above would therefore not change appreciably.

POTENTIAL SIGNIFICANT ENVIRONMENTAL EFFECTS OF THE PROPOSAL

11.104 Potential effects are defined as unmitigated effects that arise from either construction activities or from the Proposed Development itself after completion.

During construction

11.105 As a consequence of the wholescale change in land use, construction activities will result in adverse landscape and visual effects on the fabric and character of the landscape, and on visual amenity, within the local area. Whilst construction activities introduce direct and indirect disturbance to both the fabric of the landscape and the surrounding area which can be perceived by people living, working or travelling through it, these effects are temporary in nature, and can be partially mitigated.

11.106 Generic construction methods and timescales are estimated in Chapter 3: *Project description* of this PEIR, with an outline Construction Method Statement (CMS) to be submitted as a requirement of the DCO. The main elements of the construction operations, considered to be of importance to the landscape and visual assessment, are described below:

- *Construction-related traffic.* This includes vehicle movements associated with the import of building materials, machinery and labour using local roads;
- *Groundworks.* Cut and fill earthworks including the construction of two development platforms across the Main HNRFI Site, levelling for access roads and ground modelling for landscaped areas;
- *Noise and vibration effects* (see Chapter 10: *Noise and vibration*) have the potential to affect landscape character, visual effects from existing (potentially diverted) rights of way and other routes, and residential amenity; and
- *Construction activities.* Subject to the preferences of individual contractors, it is expected that generic methods will be employed in the implementation of the scheme. The use of large cranes and construction platforms (rising above the height of the proposed buildings) will be necessary.

11.107 Landscape and visual amenity effects resulting from the construction stages are considered to be consistently adverse, as there are few, if any, aspects of the process that could be considered positive in terms of promoted landscape strategies or in terms of visual amenity.

11.108 These effects will, however, be temporary and at any one time restricted by the phased nature of development (see Chapter 3). The effects of the construction phase of the Proposed Development on landscape character and visual amenity respectively are summarised below. Effects on PRoW, other recreational routes, public highways and residential areas are also described below with reference to the assessed representative viewpoints. Detailed effects will be described and assessed against each landscape character area and representative photoviewpoints within the full ES.

Potential effects on landscape character during construction

Landscape character areas

11.109 With regard to landscape character, the construction effects predicted upon those areas which cover or lie in close proximity to the Main Order Limits are identified in Table 11.11 below.

11.110 The BDCLCA provides an assessment of landscape sensitivity for its LCAs, concerning different development scenarios within Blaby District. The types of development include:

- 2-3 storey residential housing/transport infrastructure;
- small-scale commercial (B1/B2 use categories); and
- large scale commercial (warehousing – B8 use category).

11.111 The sensitivity judgements within the BDCLCA vary compared to the methodology used for this project. BDCLCA has a five-point scale ranging from low, low-medium, medium, medium-high to high. The methodology used for this assessment also uses a five-point scale and can easily be translated into the terminology used for this assessment as Table 11.9 illustrates.

Table 11.9: BDCLCA conversion to EDP sensitivity.

BDCLCA Sensitivity	**EDP Sensitivity**
Low	Very Low
Low-Medium	Low
Medium	Medium
Medium-High	High
High	Very High

11.112 Using the translated sensitivity of the LCAs, the sensitivity of development scenarios are as such:

Table 11.10: LCA sensitivity to development scenarios.

LCA	Sensitivity to Scenarios		
	2-3 storey residential housing/transport infrastructure	Small-scale commercial (B1/B2 use categories)	Large scale commercial (warehousing – B8 use category)
Aston Flamville Wooded Farmland	Medium	High	Very High
Cosby Agricultural Farmland	Medium	High	Very High
Croft Hill and Quarries	Medium	Medium	High
Elmesthorpe Floodplain	Medium	High	Very High
Stoney Stanton Rolling Farmland	Low	Medium	High

11.113 As the DCO Order Limits comprise a number of elements, ranging from 'large scale commercial' to 'transport infrastructure', the sensitivity of each LCA to those elements varies as indicated above, and as such results in varying levels of effects dependent on the treatment.

11.114 For example, Table 11.10 below demonstrates that there will be likely significant effects upon LCA 1: Aston Flamville with regard to large scale commercial development associated with the Main HNRFI Site. However, highways works associated with the M69 Junction 2 works are unlikely to result in significant effects on this LCA.

11.115 With regard to the Hinckley and Bosworth LCAs, a degree of professional judgement has been taken on determining their sensitivity.

Table 11.11: Potential construction effects on published landscape character.

	Sensitivity	**Effect**
Blaby Landscape Character Areas		
LCA 1: Aston Flamville Wooded Farmland	Very High (large scale commercial) Medium (transport infrastructure)	Major Significant Minor/Negligible Not Significant
LCA 3: Cosby Agricultural Parkland	Medium (transport infrastructure)	Minor/Negligible Not Significant
LCA 5: Croft Hill and Quarries	Medium (transport infrastructure)	Minor/Negligible Not Significant
LCA 6: Elmesthorpe Floodplain	Very High (large scale commercial)	Major/Moderate Significant
LCA: 15 Stoney Stanton Rolling Farmland	Low (transport infrastructure)	Negligible Not Significant
Hinckley and Bosworth Landscape Character Areas		
Burbage Common Rolling Farmland	Medium (transport infrastructure)	Minor Not Significant
Hinckley (UCA)	Very Low (transport infrastructure)	Negligible/None

11.116 Effects on the LCAs have been assessed within the context of the Main HNRFI Site, A47 Link Road and off-site highways, with this confirming that there will be an unavoidable localised change in character. Effects on landscape character within the wider LCAs context will result from lighting, noise, vibration and traffic which extend beyond the site boundary. The works would require temporary lighting where previously there was little artificial lighting, particularly within the main body of the site, away from the existing residential urban edges or major roads. The effects would be short-term and temporary in nature and minimised by an appropriate construction management plan designed to reduce the effects on the existing landscape receptors and the amenity of local residents.

11.117 Taking these matters into account, the overall magnitude of change upon the LCAs varies in level. This is primarily due to the proportion of each LCA the geographical extent the Proposed Development covers - i.e., components of the off-site highways take up extremely small geographic proportions of some LCAs (e.g. highways modifications B5 and B6 within Cosby Agricultural Parkland and Croft Hill Quarries LCAs).

11.118 The magnitude of change expected upon the Aston Flamville Wooded Farmland LCA as a result of the Main HNRFI Site is considered to be high, leading to an overall effect of major, adverse and significant. In terms of the elements comprising the M69 junction, construction would only result in a very low magnitude of change, with an effect of minor/negligible and not significant.

11.119 With regards to the Elmesthorpe Floodplain LCA a high magnitude of change is expected at construction, leading to an overall effect of Major/Moderate and significant as a result of the Main HNRFI Site.

11.120 In terms of the effects on the Stoney Stanton Rolling Farmland LCA, only elements of the M69 and off-site highways (B1, B2, B3, B4 and B8) works would affect the area, of which construction would result in a very low magnitude of change, leading to a negligible effect and not significant.

11.121 There would be no significant effects on the Cosby Agricultural Parkland or Croft Hill and Quarries LCAs as a result of construction works related to highways modifications B5 and B6.

11.122 In consideration of 'Burbage Common Rolling Farmland' of which the A47 Link of the Main passes through to join the B4668, this is considered to be 'transport infrastructure' and as such, the LCA is determined to have a 'medium' sensitivity to this type of development. In consideration of the construction phases, there would be a low change and a minor effect which is not significant.

11.123 Hinckley UCA would experience very little change as a result of highways modifications HB1 and HB4 that would lead to an effect of negligible/none which is not significant.

Landscape character of the main HNRFI site

11.124 Invariably, a mixed-use development on a 'greenfield' site and at the scale proposed will result in the unavoidable removal of landscape features, in particular the agricultural field

parcels and hedgerows, at a level which materially alters the character of the receiving environment. In essence, there will be wholesale change at this stage from an operational agricultural landscape to a construction site.

11.125 This change will result in a very high magnitude of change on a medium sensitivity landscape, which will generate a major/moderate, short- term and locally significant adverse effect. This is not the effect upon the wider landscape character areas, but solely reflective of the site-based change.

Landscape character of the A47 Link

11.126 The fieldscape character of A47 Link will be gradually transformed from agricultural farmland to a Link Road embanked on either side, whilst to the south a naturalistic character with open access, adjacent to the Burbage Common and Woods Country Park. This would result in potential significant, temporary adverse effects during construction as the character is completely altered, whilst the field margins, field boundary hedgerows and trees would for the most part be retained, and the perception of field structure would remain.

Landscape character of off-site highways and junctions

11.127 Effects upon the landscape character of off-site highways and junctions will be extremely limited given the nature of the change which will involve additional signage, occasional road calming measures and minor adjustments to the existing highway network. As such there would be a very low magnitude of change to these areas, resulting in a neutral effect of negligible/none which would not be significant.

Visual amenity

11.128 Locations of representative receptor photoviewpoints are illustrated on Figures 11.9. The photoviewpoints themselves are provided as Figure 11.10. PRoW locations with route numbering are provided on Figure 11.3. Receptor sensitivity is described in Table 11.12 with the sensitivity of visual receptors varying according to category, context of the view and susceptibility to change.

Table 11.12: Potential construction effects on visual receptor groups.

Photoviewpoint numbers	Receptor and location	Sensitivity	Effect
Residences and Settlements			
-	Residents at Aston Firs Campsite	Very High	Substantial Adverse Temporary Significant
-	Residents at Averley Farm House	Very High	Major Adverse Temporary Significant
-	Residents at Bridge Farm	Very High	Substantial Adverse Temporary Significant
17, 47	Residents at Billington Rough	Very High	Moderate Adverse Temporary Significant
3	Residents at Wood House Farm	Very High	Substantial Adverse

Photoviewpoint numbers	Receptor and location	Sensitivity	Effect
			Temporary Significant
20, 21	Residents at Oaklands	Very High	Major/Moderate Adverse Temporary Significant
22	Residents at Stanton Road	Very High	Major Adverse Temporary Significant
7	Residents at Burbage Common Road	Very High	Substantial Adverse Temporary Significant
	Residents at Burbage Common Road west	Very High	Substantial Adverse Temporary Significant
26	Residents at Barwell	Very High	Major Adverse Temporary

Photoviewpoint numbers	Receptor and location	Sensitivity	Effect
			Significant
25	Residents at Church Lane, Dovecote way, St Mary's Close and Barwell Lane, Barwell	Very High	Major Adverse Temporary Significant
9	Residents at Highgate Lodge Farm and Red Hill Farm	Very High	Moderate Adverse Temporary Significant
40	Residents at Earl Shilton	Very High	Moderate/Minor Adverse Temporary Not Significant
46	Residents at B4668 between Burbage Common Road and A47	Very High	Moderate Adverse Temporary Significant
	Residents at Gypsy and traveller settlement off Smithy Lane	Very High	Substantial Adverse Temporary Significant

Photoviewpoint numbers	Receptor and location	Sensitivity	Effect
	Residents at Gypsy and traveller camp off B4668	Very High	Substantial Adverse Temporary Significant
Public Rights of Way, National Cycle Routes and Open Access Land			
-	Leicestershire Round	High	Minor Adverse Temporary Not Significant
-	Footpath T89 (between Wentworth Arms Pub and the A47, east Elmesthorpe)	High	Major/Moderate Adverse Temporary Significant
-	Footpath U8 (Outwoods rail crossing (modification HB4)	High	Major/Moderate Adverse Temporary Significant
-	Footpath U17 (Thorney Fields Farm rail crossing (modification B8)	High	Major/Moderate Adverse Temporary

Photoviewpoint numbers	Receptor and location	Sensitivity	Effect
			Significant
-	Footpath U20 (between Station Road/B581 and A47, Elmesthorpe)	High	No Effect
-	Footpath U49 (Burbage Common and Woods Country Park)	High	Minor Adverse Temporary Not Significant
2, 6	Footpath U50 (links Billington Rough with Aston Firs)	High	Major Adverse Temporary Significant
3, 4	Footpath U52 (links Burbage Common Road bridge with Burbage Common and Woods Country Park, and south to Outwoods rail crossing (modification HB4)	High	Major/Moderate Adverse Temporary Significant
9	Footpath U53 (east of Main HNRFI Site, passing Red Hill Farm, connecting to Sapcote)	High	Major Adverse Temporary Significant
14	Footpath U63	High	No Change

Photoviewpoint numbers	Receptor and location	Sensitivity	Effect
	(between Aston Flamville and Burbage)		No Effect
-	Footpath V22 (near Hissar Farm House on A47 Link Road)	High	Moderate/Minor Adverse Temporary Not Significant
5, 47	Footpath V23 (travels northwest from Burbage Common Road within Main HNRFI Site to B4668)	High	Major/Moderate Adverse Temporary Significant
-	Footpath V30 (Along M69 south of Main HNRFI Site near Aston Flamville)	High	Minor Adverse Temporary Not Significant
1	Footpath V35 (Between M69 Junction 2 and Burbage Common Road bridge)	High	Major Adverse Temporary Significant
-	Footpath V36 (West of Aston Flamville)	High	No Effect

Photoviewpoint numbers	Receptor and location	Sensitivity	Effect
39	Footpath V37 (Heads north from Aston Flamville)	High	Minor Adverse Temporary Not Significant
22	Footpath V49 (Links south of Stoney Stanton to Hinckley Road near Averley House Farm)	High	Moderate/Minor Adverse Temporary Not significant
-	Bridleway U11 (Outwoods rail crossing (modification HB4) to Hinckley)	High	Major/Moderate Adverse Temporary Significant
-	Bridleway U51 (Burbage Common and Woods Country Park)	High	Moderate/Minor Adverse Temporary Not Significant
17, 18	Bridleway U52 (Between Elmesthorpe and Bridge Farm)	High	Major/Moderate Adverse Temporary Significant

Photoviewpoint numbers	Receptor and location	Sensitivity	Effect
8, 11, 21, 37	Bridleway V29 (Between Freeholt Lodge, Huncote Road north Sapcote and Aston Lane west Sharnford)	High	Major Adverse Temporary Significant to Moderate/Minor Adverse Temporary Not significant
15, 36, 43, 44	Burbage Common Country Park	High	Major/Moderate to Moderate Adverse Temporary Significant
Public Highways			
8, 12, 13, 20, 28	M69 Motorway	Very Low	Moderate/Minor Adverse Temporary Not Significant
10, 29	B4669	Low	Moderate/Minor Adverse Temporary

Photoviewpoint numbers	Receptor and location	Sensitivity	Effect
			Not Significant to Minor/Negligible Adverse Temporary Not Significant
20, 21, 48	B581	Low	Moderate Adverse Temporary Significant to Minor/Negligible Adverse Temporary Not Significant
56	A47	Very Low	Negligible Adverse Temporary Not Significant
45, 46	B4668	Low	TBC
4, 7, 16	Burbage Common Road	Medium	Major/Moderate Adverse

Photoviewpoint numbers	Receptor and location	Sensitivity	Effect
			Temporary Significant
22	Stanton Lane	Medium	Minor Adverse Temporary Not significant
-	Smithy Lane	Medium	Minor/Negligible Adverse Temporary Not Significant
12	Aston Lane	Medium	Minor/Negligible Adverse Temporary Not significant
13	Lychgate Lane	Medium	Minor/Negligible Adverse Temporary Not significant
28	Pingle Lane	Medium	Minor Adverse Temporary

Photoviewpoint numbers	Receptor and location	Sensitivity	Effect
			Not significant
27	Thurlastone Lane	Medium	Minor Adverse Temporary Not significant
38	Mill Lane	Medium	Minor/Negligible Adverse Temporary Not Significant
Railways			
4, 5	Leicester to Hinckley Railway	Very Low	Moderate/Minor Temporary Adverse Not Significant

Homes and settlements

11.129 The residential receptors that have the greatest potential to be affected by the Proposed Development are set out in Technical Appendix 11.1.

11.130 During the construction phases there would be include likely potential significant adverse effects for a number of dwellings in close proximity to the Main HNRFI Site, including Aston Firs Campsite (off Smithy Lane) and the nearby Gypsy and Traveller site (also off Smithy Lane) due to their proximity to the main entrance to the Main HNRFI Site which will feature extensive construction works, groundworks and engineering in order to establish a next exit off the M69 Junction 2. Beyond this phase of works, it is anticipated that the

construction of warehouse units and rail freight infrastructure integral to the Main HNRFI Site will also result in a significant adverse effect upon northern views from these groups of dwellings.

11.131 Dwellings along Burbage Common Road (Photoviewpoint 1) are likely to experience potential significant adverse effects during the construction phases of the Main HNRFI Site, with potential views southwards of major land regrading establishment of development platforms and the general construction of the scheme to completion.

11.132 In terms of dwellings along the western end of Burbage Common Road, those located at the northern extent of the Country Park are unlikely to have clear views of the early phases of the construction process (ground remodelling and establishing development platforms) due to a combination of topography and mature vegetation which screen views in the direction of the Main HNRFI Site, whilst there might be limited views of the upper storeys of warehouse construction and crane operations associated with the SRFI to the east. The foreground view from these dwellings would however significantly change during the construction process whilst the A47 Link is established to the north, cutting through the fieldscape, whilst the area south of the A47 will be gradually transformed from agricultural farmland to a naturalistic character with open access, adjacent to the existing asset of Burbage Common and Woods Country Park. This would result in potential significant adverse effects during construction. Those dwellings at the very western edge of Burbage Common Road (at the junction with the B4668) are unlikely to obtain any views towards the Main HNRFI Site and A47 Link Road would therefore experience no significant visual effects.

11.133 Bridge Farm is located close to the A47 Link Road near its connection with the main body of the Main HNRFI Site (to the east) and is located on elevated ground. There would be potential significant visual effects on this dwelling due to the proximity to the Proposed Development, there would be possible views west over the construction phase, including groundworks to the construction of the SRFI and B8 buildings. It should be noted that it is intended to construct a bund along the northern edge of the railway, which will be planted up to provide a future visual screen and filter. South and west, there would be views of the construction of the A47 Link Road including development of the large area of POS adjacent to the Country Park.

11.134 Averley Farm House is located opposite the proposed M69 Junction 2 and Hinckley Road (B4669) works and is likely to experience potential adverse, close range significant visual effects as a result of roadworks and engineering. The slightly elevated ground on which the farm is located is also likely to offer views west and north-west over the Main HNRFI Site which would comprise significant ground remodelling and construction of the overall Main HNRFI Site during the construction Phase. Effects are likely to be significant and adverse.

11.135 In terms of dwellings at Billington Rough located north of the Main HNRFI Site between the Leicester to Hinckley railway and Elmesthorpe, views are in part illustrated by Photoviewpoint 17, 47 and 18 taken from the nearby surrounding PRoW network. Views towards the Main HNRFI Site would, in part, be screened by mature vegetation which

particularly limits views east. There may be potential elevated views south and south-eastwards to construction phases of the main body of the Main HNRFI Site; including the establishment of development platforms, through to the construction of B8 buildings which would likely result in significant adverse effects. Views south and south-west are also likely to incorporate the construction of the A47 Link Road (which will require construction of embankments) to the existing agricultural fieldscape.

11.136 With regard to Wood House Farm, located within Burbage Common and Woods Country Park at the northern extend of Smithy Lane, due to a combination of mature vegetation and topography, views of construction work at the Main HNRFI Site for the most part would be filtered, if not screened (see Photoviewpoint 42). However, there will however be some views towards the western edge of the Main HNRFI Site, of which construction processes would be readily visible from initial groundworks through to the completion of B8 buildings, albeit filtered by vegetation. As such there would be potential significant adverse visual effects.

11.137 Dwellings at Oaklands comprise a small group on Station Road (B581) east of Elmesthorpe which currently have filtered views towards the Main HNRFI Site, represented in part by Photoviewpoint 21. During the construction phase there would be potential for significant adverse visual effects, likely in the latter stages with the construction of B8 buildings along the eastern edge of the Main HNRFI Site. Views of the early stages of the construction process (i.e. ground remodelling to establish development platforms) would not be visible due to a combination of topography and mature vegetation. Construction of works of the A47 Link would not be visible from this receptor.

11.138 For dwellings located on Station Road located at the northern extent of the proposed construction access road for the Main HNRFI Site, there will be little change to views for the majority of dwellings due to mature vegetation forming their rear curtilage views. Two dwellings at the eastern end of this road have potential to experience significant visual effects as their rear curtilages.

11.139 Along the B4668 Leicester Road between Burbage Common Road and the B4668 / A47 roundabout a small group of dwellings is located near the roundabout. Views from the rear of these dwellings are filtered and screened by mature vegetation that is likely to limit the potential for significant adverse effects during the construction of the Main HNRFI Site. However, the proximity of these dwellings to the works proposed for the HB2 and HB3 highways modifications roundabout may result in potential, temporary significant adverse visual effects. No other parts of the off-site highways would result in potential significant adverse effects upon this receptor.

11.140 Further south on the B4668, a Gypsy and traveller site located opposite Hinckley Rugby Club would experience close range, significant adverse visual effects associated with the construction of the A47 Link Road construction.

11.141 Dwellings located at the edge of the elevated settlements of Barwell and Earl Shilton would potentially have distant views over the Main HNRFI Site (representative Photoviewpoint 25 and 26). There would be significant adverse effects as a result of the

construction phase, from initial establishment of platforms, to construction of the B8 buildings, by where agricultural fields will change into a large scale, warehouse development. Views of the A47 Link Road and highways modifications HB2 and HB3 would also be possible.

11.142 However, it is important to note that this effect would only be apparent for certain parts of certain properties, and not as a wholescale effect across the groups. The worst of the effects during construction (i.e. the movement and activity of construction vehicles and operations) would be short term in duration, reversible and local. These effects would be short-term on the basis that in any one location the construction would be apparent.

Public rights of way, long distance recreational routes and open access land

11.143 As shown on Figure 11.3, a number of footpaths/bridleways traverse the Main HNRFI Site and the study area. Figure 11.9 illustrates the locations of the Photoviewpoints. Figure 11.10, Photoviewpoints 1, 2, 3, 4, 5, 6, 8 and 37 illustrate views from sections of PRoW across the Main HNRFI Site. Most of these routes will be diverted or extinguished in some way. Throughout the evolution of the project, the maintenance of PRoW connections across the Main HNRFI Site for a range of users has been a key consideration, informing the Illustrative Masterplan through a Public Rights of Way Strategy (Figure 11.4). Unsurprisingly, during the construction process which will include groundworks (the creation of development platforms), there will likely be temporary PRoW diversions, whilst there will be wholescale adverse significant visual effects from an early stage for all PRoW based on the Main HNRFI Site which include:

- Footpath U50 (Photoviewpoint 2 and 6);
- Footpath U52 (Photoviewpoint 3 and 4);
- Footpath V23 (Photoviewpoint 5);
- Footpath V35 (Photoviewpoint 1);
- Bridleway U52 (Photoviewpoint 4); and
- Bridleway V29 (Photoviewpoint 8 and 37).

11.144 Beyond the confines of the Main HNRFI Site, other PRoW that have the potential to experience significant effects during construction phases include:

- Footpath U53 (Photoviewpoint 9);
- Footpath V52 (Photoviewpoint 42);
- Bridleway U52 (Photoviewpoint 17);
- Bridleway V29 (Photoviewpoint 21);

- Footpath V22;
- Footpath V23 (Photoviewpoint 47);
- Bridleway U9; and
- Footpath V23 (Photoviewpoint 47).

11.145 In terms of PRoW likely to experience potential effects related to construction of works at the M69, these include:

- Footpath V30;
- Footpath V36;
- Footpath V37; and
- Footpath U63.

11.146 In terms of PRoW likely to experience potential effects related to construction of off-site highways works, these include:

- Footpath U8 (highways modification HB4);
- Footpath U52 (highways modification HB4);
- Bridleway U11 (highways modification HB4); and
- Footpath U17 (highways modification B8).

11.147 However, it should be noted that these potential significant adverse effects from the M69 and off-site highways are generally limited to where the PRoW joins, passes through or is located in very close proximity to DCO Order Limits (i.e., in most cases the effects would be extremely localised). Further assessment will be needed once further detail of the works required for these elements of the off-site highways is known, but in most cases they are likely to represent minor highways alterations to what is already of a highways character.

11.148 Highways modifications HB4 and B8 consist of closing up of pedestrian level crossings over railway lines which will be diverted on safer routes over existing and proposed bridges.

11.149 With particular regard to long distance recreational routes, one is located within the broad 5km study area, the Leicestershire Round. Despite the close proximity in which part of this route falls adjacent to the south-western boundary, a short section (c.200m) may experience views of upper levels of construction above mature vegetation (Photoviewpoint 42). However, it should be noted that the level of effect arising from the Main HNRFI Site and A47 Link Road will diminish with distance and level of intervening screening element such as vegetation, built form and topography and on the Leicestershire Round as a whole, the magnitude of change to views will be very low,

leading to a minor adverse effect which is not significant.

11.150 In terms of open access land there would be limited significant adverse effects at some select locations within Burbage Common and Woods Country Park (Photoviewpoint 36, 42, 43 and 44) that would comprise principally the construction of the upper levels of B8 buildings and the A47 Link Road from the Main HNRFI Site, as well as the conversion of agricultural land south of the A47 Link Road to a naturalistic open space.

11.151 No National Cycle Routes (NCRs) within the 5km broad study area are considered to have the potential to experience significant effects as a result of the Proposed Development.

11.152 Effects at this level are not surprising. The conversion of any greenfield site to a major development site would yield such an outcome and this is not a reflection on the quality of the project master plan, but of the process that requires an assumption to be made that most people would see the visual and sensory change from greenfield to construction site as adverse.

Public highways

11.153 Those local road network receptors that have the greatest potential to be affected by the Proposed Development are set out in Appendix 11.1.

11.154 The assessment has shown that during the construction phase there would be significant adverse effects upon Burbage Common Road which currently passes through the Main HNRFI Site. The section which heads north from the Main HNRFI Site to the B581 will closed upon commencement of the construction phase which will change the character of this route from a rural through road to a dead end whilst pedestrian, cycle, equestrian and emergency vehicle access will be provided through the Main HNRFI Site at appropriate points during the construction phases. Where the route passes through the Main HNRFI Site, this will be entirely removed as the phases of development come forward, initially with the creation of development platforms. Beyond the Main HNRFI Site to the west, Burbage Common Road will continue its route with some minor adjustments just west of the railway, continuing to provide access to Burbage Common and Wood Country Park, as well as to the B4668. That said, the construction of the A47 Link Road will result in potential significant adverse effects along this section, whilst extensive works south of it (that will be beneficial in the long term) in the adjacent farmland north of the road will comprise the conversion to a naturalistic open access character consistent with the existing Country Park. There will also be potential significant adverse effects when looking back along the western extent of Burbage Common Road towards the main body of the Main HNRFI Site which will contain the construction of the SRFI and commercial B8 buildings.

11.155 The M69 motorway passes adjacent to the eastern edge of the Main HNRFI Site and receptors on it could potentially experience significant adverse effects due to the construction phase. Users of the route will be travelling at speed, with their primary focus on the road ahead. The large-scale ground remodelling to create development platforms, construction of warehouse units and establishment of boundary treatments along this

edge is likely to result in glimpsed significant adverse effects that would be experienced when immediately passing the Main HNRFI Site, which would reduce rapidly beyond it.

11.156 In terms of the construction works required to other roads within the Main Order Limits, these are unlikely to result in significant adverse effects upon users of those routes due to the likely limited nature of the works (i.e. signage, road calming measures).

11.157 Elsewhere within the 2km detailed study area, there may be occasional glimpses towards construction works at the Main HNRFI Site from the surrounding road network. However, in most instances these would only be oblique, glimpsed views that would be largely interrupted by a combination of topography, mature vegetation and/or built form that would limit the potential for significant adverse effects.

Railways

11.158 There would be potential significant adverse effects upon the railway network passing through the Main HNRFI Site throughout the construction process. Trains are likely to be temporarily speed limited during as they pass through during part of the construction process (in particular whilst the connections are being made to the mainline), obtaining oblique, open views over much of the Main HNRFI Site including the A47 Link and west of the railway line. There may also be glimpses of the modifications to the Outwoods (HB4), Thorney Fields (B8) and Elmesthorpe railways crossings. Post the connection to the mainline, trains are likely to be able to return to full linespeed (subject to a risk assessment and agreement with National Rail), such that views of construction of the Main HNRFI Site and A47 would become far more glimpsed and oblique.

11.159 Beyond the immediate bounds of the Main Order Limits, there are unlikely to be significant adverse effects upon receptors due to the transient, oblique, glimpsed nature of views that are generally limited by embankments and or/mature vegetation within the landscape.

During operation

Post-completion stage effects on the landscape resource

11.160 This section offers an assessment of the post-completion (i.e. at Year 1, before the full effects of mitigation measures are realised) on the landscape resource; visual effects are considered separately, below. This section describes the anticipated effects of the Proposed Development during its operational lifetime and assesses the significance of those effects in landscape and visual amenity terms.

11.161 In practical terms, the 'operational lifetime' of the Proposed Development is measured in decades, as it would result in a permanent change to the character of the development site. Given that the Proposed Development includes landscape proposals, which would in any event take time to mature, and that all new development can seem 'raw' until it has 'settled' into its landscape context, the assessment of operational effects for specific areas and views considers the effects at two distinct points in time:

- when the Proposed Development is fully operational (Year 1) and all construction phases have ceased; and
- 15 years after completion of the Proposed Development (such that mitigation planting may have matured and/or materials weathered).

11.162 It is often the case that initial (Year 1) effects are more considerable than those at Year 15 of operation due to the limited initial effect of the landscape proposals. It is also the case, that in reality, there would be a number of phases of construction, by where parts of the Proposed Development and mitigation would be completed before others. Such that is the case that by 'Year 1' of operation, parts of the Landscape Strategy planted in the early stages of the 10-year construction phase timespan would already have matured and provided benefit.

Landscape character

Landscape character areas

11.163 With regard to landscape character areas, the effects upon Year 1 of completion upon those areas which cover or lie in close proximity to the DCO Order Limits are detailed in Table 11.13 below.

Table 11.13: Potential operational effects at year 1 on published landscape character.

Landscape	Sensitivity	Effect
Blaby Landscape Character Areas		
LCA 1: Aston Flamville Wooded Farmland	Very High (large scale commercial) Medium (transport infrastructure)	Major Significant Minor/Negligible Not Significant
LCA 3: Cosby Agricultural Parkland	Medium (transport infrastructure)	Minor/Negligible Not Significant
LCA 5: Croft Hill and Quarries	Medium (transport infrastructure)	Minor/Negligible

Landscape	Sensitivity	Effect
		Not Significant
LCA 6: Elmesthorpe Floodplain	Very High (large scale commercial)	Major/Moderate Significant
LCA: 15 Stoney Stanton Rolling Farmland	Low (transport infrastructure)	Negligible Not Significant
Hinckley and Bosworth Landscape Character Areas		
Burbage Common Rolling Farmland	Medium (transport infrastructure)	Minor Not Significant
Hinckley (UCA)	Very Low (transport infrastructure)	Negligible/None

11.164 The magnitude of change expected upon the Aston Flamville Wooded Farmland LCA as a result of the completed HNRFI would be high, leading to an overall effect of major, adverse, permanent and significant. In terms of the elements comprising the M69 works, these would only result in a very low magnitude of change, with an effect of minor/negligible, adverse, permanent and not significant.

11.165 With regards to the Elmesthorpe Floodplain LCA a high magnitude of change is expected upon Year 1 of completion, leading to an overall effect of major/moderate and significant as a result of development at the Main HNRFI Site.

11.166 There would be minor/negligible effects which would be neutral and permanent and neutral in nature on the Cosby Agricultural Parkland or Croft Hill and Quarries LCAs as a result of completed junction works related to the highways modifications B5 and B6. These would not be significant.

11.167 In consideration of 'Burbage Common Rolling Farmland' of which the A47 Link passes through to join the B4668 and the highways modifications (HB2 and HB3), this is considered to be 'transport infrastructure' and as such, the LCA is determined to have a 'medium' sensitive to this type of development. In consideration of the completed A47 Link Road, there would be a low change and a minor effect which is not significant which

would be permanent and adverse in nature.

11.168 Hinckley UCA would experience very little change as a result of very minor completed junction works of highways modification HB1 and HB4, of which the effects would be negligible/none, neutral, permanent and not significant.

Landscape character of the main HNRFI site

11.169 Invariably, a development on a 'greenfield' site' would result in the unavoidable loss of grassland margins, arable and pasture land, and the necessary removal of some characteristic landscape features, in particular hedgerows and trees in order to allow for development of the HNRFI. This will be at a level that will materially alter the character of the receiving environment. There would also be level changes across much of the Main HNRFI Site to allow for development platforms, whilst the Sustainable Drainage Scheme (SuDS) will introduce a number of small to large size permanently wet basins. The stream running through the Main HNRFI Site will also be diverted and in part culverted.

11.170 With reference to Chapter 12 *Ecology*, there would be a loss of 12.67km of hedgerows in moderate condition, whilst 4.48km would be retained 1.32km of poor-quality hedgerow would be lost whilst 310m would be retained and enhanced.

11.171 In response to these losses, 13.76km of new hedgerow would be created on site, whilst 9.19ha of woodland vegetation would be planted.

11.172 Effects upon the landscape character of the site at Year 1 post-completion of the Proposed Development will be described in detail in a technical appendix that will be submitted with the ES. At this preliminary stage, at Year 1 it is expected there would be a major/moderate, significant, adverse, permanent effect across the Main HNRFI Site.

Landscape character of the A47 Link Road

11.173 The fieldscape character of A47 Link Road corridor will be gradually transformed from agricultural farmland to a Link Road embanked on either side, whilst to the south of the A47 Link Road itself would remain intact, field boundaries would be retained as far as practically possible as would the scattered mature hedgerow trees. The area (comprising approximately 22.66 hectares) will have been transformed from an agricultural fieldscape to one comprising newly planted trees, areas of scrub (Figure 11.15), meadow grassland, providing GI links to the woodland to the north-west and to the existing Country Park to the south. There would be a high change that would be significant, however it would be beneficial and permanent in nature.

Landscape character of off-site highways and junctions

11.174 Effects upon the landscape character of off-site highways and junctions would be extremely limited given the nature of the change, which would involve additional signage, occasional road calming measure and minor adjustments to the existing highway network. As such there would be a very low magnitude of change to these areas, resulting in a

neutral effect of negligible/none which would not be significant.

Visual amenity

11.175 Locations of representative receptor photoviewpoints are illustrated on Figures 11.9. The photoviewpoints themselves are provided as Figure 11.10. Receptor sensitivity is described in Table 11.9 with the sensitivity of visual receptors varying according to category, context of the view and susceptibility to change. Modelled views of the scheme parameters are contained within Figure 11.16, in which it should be noted that these views represent the scheme parameters within which built development will be placed and do not represent the scheme layout which would comprise the rail port and a series of units with landscape planting and open space within the parameters shown. The potential effects at Year 1 of completion predicted for each receptor is included in Table 11.14 below.

Table 11.14: Potential Operational Effects at Year 1 on Visual Receptor Groups.

Photoviewpoint numbers	Receptor and Location	Sensitivity	Effect
Homes and Settlements			
-	Residents at Aston Firs Campsite	Very High	Substantial Adverse Permanent Significant
-	Residents at Averley Farm House	Very High	Major Adverse Permanent Significant

Photoviewpoint numbers	Receptor and Location	Sensitivity	Effect
-	Residents at Bridge Farm	Very High	Moderate Adverse Permanent Significant
17	Residents at Billington Rough	Very High	Moderate Adverse Permanent Significant
3	Residents at Wood House Farm	Very High	Substantial Adverse Permanent Significant
20, 21	Residents at Oaklands	Very High	Major/Moderate Adverse Permanent Significant
22	Residents at Stanton Road	Very High	Major Adverse Permanent Significant

Photoviewpoint numbers	Receptor and Location	Sensitivity	Effect
7	Residents at Burbage Common Road	Very High	Substantial Adverse Permanent Significant
	Residents at Burbage Common Road west	Very High	Substantial Adverse Permanent Significant
26	Residents at Barwell	Very High	Major Adverse Permanent Significant
25	Residents at Church Lane, Dovecote way, St Mary's Close and Barwell Lane, Barwell	Very High	Major Adverse Permanent Significant
9	Residents at Highgate Lodge Farm and Red Hill Farm	Very High	Moderate Adverse Permanent Significant

Photoviewpoint numbers	Receptor and Location	Sensitivity	Effect
40	Residents at Earl Shilton	Very High	Moderate/Minor Adverse Permanent Not Significant
46	Residents at B4668 between Burbage Common Road and A47	Very High	Moderate Adverse Permanent Significant
-	Residents at Gypsy and traveller settlement off Smithy Lane	Very High	Substantial Adverse Permanent Significant
-	Residents at Gypsy and traveller camp off B4668	Very High	Substantial Adverse Permanent Significant
Public Rights of Way, National Cycle Routes and Open Access Land			

Photoviewpoint numbers	Receptor and Location	Sensitivity	Effect
-	Leicestershire Round	High	Minor Adverse Permanent Not Significant
-	Footpath T89 (between Wentworth Arms Pub and the A47, east Elmesthorpe)	High	Moderate Adverse Permanent Significant
-	Footpath U8 (Outwoods rail crossing (modification HB4)	High	Moderate Adverse Permanent Significant
-	Footpath U17 (Thorney Fields Farm rail crossing (modification B8)	High	Moderate Adverse Permanent Significant
-	Footpath U20 (between Station Road/B581 and A47, Elmesthorpe)	High	No Change Neutral Permanent No Effect

Photoviewpoint numbers	Receptor and Location	Sensitivity	Effect
-	Footpath U49 (Burbage Common and Woods Country Park)	High	Minor Adverse Permanent Not Significant
2, 6	Footpath U50 (links Billington Rough with Aston Firs)	High	Major Adverse Permanent Significant
3, 4	Footpath U52 (links Burbage Common Road bridge with Burbage Common and Woods Country Park)	High	Major Adverse Permanent Significant
9	Footpath U53 (east of Main HNRFI Site, passing Red Hill Farm, connecting to Sapcote)	High	Major Adverse Permanent Significant
14	Footpath U63 (between Aston Flamville and Burbage)	High	No Change Neutral Permanent No Effect

Photoviewpoint numbers	Receptor and Location	Sensitivity	Effect
-	Footpath V22 (near Hissar Farm House on A47 Link Road)	High	Moderate/Minor Adverse Permanent Not Significant
5	Footpath V23 (travels northwest from Burbage Common Road within Main HNRFI Site to B4668)	High	Major/Moderate Adverse Permanent Significant
-	Footpath V30 (Along M69 south of Main HNRFI Site near Aston Flamville)	High	Minor Adverse Permanent Not Significant
1	Footpath V35 (Between M69 Junction 2 and Burbage Common Road bridge)	High	Major Adverse Permanent Significant
-	Footpath V36 (West of Aston Flamville)	High	No Change Neutral Permanent No Effect

Photoviewpoint numbers	Receptor and Location	Sensitivity	Effect
-	Footpath V37 (Heads north from Aston Flamville)	High	Minor Adverse Permanent Not Significant
22	Footpath V49 (Links south of Stoney Stanton to Hinckley Road near Averley House Farm)	High	Moderate/Minor Adverse Permanent Not significant
-	Bridleway U11 (Outwoods rail crossing (modification HB4) to Hinckley)	High	Moderate Adverse Permanent Significant
-	Bridleway U51 (Burbage Common and Woods Country Park)	High	Minor Adverse Permanent Not Significant
17, 18	Bridleway U52 (Between Elmesthorpe and Bridge Farm)	High	Major/Moderate Adverse Permanent Significant

Photoviewpoint numbers	Receptor and Location	Sensitivity	Effect
8, 11, 21, 37	Bridleway V29 (Between Freeholt Lodge, Huncote Road north Sapcote and Aston Lane west Sharnford)	High	Major Adverse Permanent Significant to Moderate/Minor Adverse Permanent Not significant
15, 36, 43, 44	Burbage Common Country Park	High	Major/Moderate to Moderate Adverse Permanent Significant
Public Highways			
8, 12, 13, 20, 28, 49, 50	M69 Motorway	Very Low	Moderate/Minor Neutral Permanent Not Significant

Photoviewpoint numbers	Receptor and Location	Sensitivity	Effect
10, 29	B4669	Low	Moderate/Minor Neutral Permanent Not Significant to Minor/Negligible Neutral Permanent Not Significant
20, 21, 47, 48	B581	Low	Minor/Negligible Neutral Permanent Not Significant
56	A47	Low	Negligible Neutral Permanent Not Significant
45, 46	B4668	Low	Negligible Neutral Permanent Not Significant

Photoviewpoint numbers	Receptor and Location	Sensitivity	Effect
4, 7, 16	Burbage Common Road	Medium	Major/Moderate Adverse Permanent Significant
22	Stanton Lane	Medium	Minor/Negligible Adverse Permanent Not Significant
-	Smithy Lane	Medium	Minor/Negligible Adverse Permanent Not Significant
12	Aston Lane	Medium	Minor/Negligible Adverse Permanent Not significant
13	Lychgate Lane	Medium	Minor/Negligible Adverse Permanent Not significant

Photoviewpoint numbers	Receptor and Location	Sensitivity	Effect
28	Pingle Lane	Medium	Minor Adverse Permanent Not significant
27	Thurlastone Lane	Medium	Minor Adverse Permanent Not significant
38	Mill Lane	Medium	Minor Adverse Permanent Not Significant
Railways			
4, 5	Leicester to Hinckley Railway	Very Low	Moderate/Minor Permanent Adverse Not Significant

Homes and settlements

11.176 A summary of the effects on the residential amenity of residential areas during Year 1 of completion is set out below.

11.177 During Year 1 of completion there would be likely potential significant adverse effects for a number of dwellings in close proximity to the Main HNRFI Site, including Aston Firs Campsite (off Smithy Lane) and the adjacent Gypsy and traveller site due to their proximity to the main entrance to the Main HNRFI Site, which will feature the newly completed exit off the M69 Junction 2. Views north from this group would comprise warehouse units and internal infrastructure integral to the Main HNRFI Site which will also result in a significant adverse effect upon northern views from these groups of dwellings. The Landscape Strategy (Figure 11.15) will be newly planted, and whilst it would provide some initial softening to views northwards.

11.178 Upon completion, along the northern end of Burbage Common Road (Photoviewpoint 1) construction will have ceased, as will the potential significant adverse effects associated with construction. The route will have changed from a through road, through the area of the Main HNRFI Site to one which provides access to residents at the northern end of Burbage Common Road, whilst cyclists, pedestrians, equestrian users and emergency vehicles will still be able to obtain access southwards through the Main HNRFI Site. Views from dwellings southwards towards the Main HNRFI Site are likely to comprise horizontal built form of B8 buildings across most of the view, whilst woodland planting at the northern extent of the Main HNRFI Site will still be in the early stages of growth. As such there would be potential significant adverse effects upon this group.

11.179 In terms of dwellings along the western end of Burbage Common Road, those located at the northern extent of the Country Park will have oblique limited views of the upper storeys of warehouse and crane operations associated with the SRFI to the east. A recently constructed earth bund with woodland along the northern edge of the railway would provide some early filtering of views, there would be adverse visual effects arising from the Main HNRFI Site which would not be significant. In terms of the foreground view from these dwellings the completed A47 Link Road would be a subtle addition to the view due to its low-lying nature, whilst the newly planted area of POS adjacent to Burbage Common and Woods Country Park would provide a naturalistic, attractive character with open access. This would result in potential significant beneficial effects. Those dwellings located at the very western end of Burbage Common Road adjacent to the B4668 Leicester Road would experience no significant effects as a result of either the A47 Link Road or Main HNRFI Site, views being restricted by intervening woodland and existing commercial buildings.

11.180 In terms of Bridge Farm, which is located close to the A47 Link Road near its connection with the Main HNRFI Site, there would be potential significant adverse visual effects on this dwelling due to the proximity to the Proposed Development, with notable close-range changes to views east, south and west of the dwelling. In views to the east there will be partial views of the Railport and B8 buildings beyond a constructed bund (planted with vegetation) along the northern edge of the railway. To the south and west, there would be views of the A47 Link Road and the proposed area of public open space adjacent to the Country Park (just south of the A47 Link Road) with the former located concealed by low embankments, screening the route from view.

11.181 Averley Farm House is likely to experience potential significant adverse effects at close

range as a result of completion of development at the Main HNRFI Site which would comprise a new exit off Junction 2 of the M69 and a number of large warehouse units across a previously agricultural landscape. Effects are likely to be significant and adverse, whilst landscape planting will not have matured sufficiently to soften views in this direction.

11.182 Photoviewpoint 17, 47 and 18 are taken from the nearby surrounding PRoW network to Billington Rough. Views towards the Main HNRFI Site would, in part, be screened by mature vegetation which particularly limits views east. There is the potential for elevated views south and south-eastwards to the Railport and B8 buildings on the Main HNRFI Site, which would likely result in significant adverse effects. Views south and south-west in the direction of the A47 Link Road will likely be screened or well filtered due to its location beyond planted embankments.

11.183 With regard to Wood House Farm, located within Burbage Common and Woods Country Park at the northern extent of Smithy Lane, views towards of the Main HNRFI Site for the most part would be filtered, if not screened (see Photoviewpoint 42). However, there would be some views towards the western edge of the Main HNRFI Site, of which B8 buildings would be a notable feature on the skyline, albeit filtered by vegetation. As such there would be potential significant adverse visual effects.

11.184 Dwellings at Oaklands will have filtered views towards the Main HNRFI Site, represented in part by Photoviewpoint 21. Upon completion there would be potential for significant adverse visual effects as a result of completed B8 buildings which will run visually horizontally across the view adjacent to the route of the M69. Completed works along the M69 would not be visible from this receptor.

11.185 Those dwellings located on Stanton Road located at the northern extent of the proposed construction access road for the Main HNRFI Site. There will be little change to views for the majority of dwellings at completion due to mature vegetation forming their rear curtilage views. Two dwellings at the eastern end of this road have potential to experience significant visual effects as their rear curtilages which will comprise warehouse units within the Main HNRFI Site, whilst newly planted woodland will still be in its early stages of maturity, providing some ground and low-level filtering.

11.186 Along the B4668 between Burbage Common Road and A47 roundabout, a small group of dwellings is located near the roundabout. Views towards the Main HNRFI Site would be screened by mature vegetation or filtered heavily to such a degree that there would not be potential for significant effects. In terms of completed elements of the highways modifications at HB2 and HB3 at the A47/B4668, these are likely to result in a very low change, and unlikely to result in significant adverse effects.

11.187 The Gypsy and Traveller site located opposite Hinckley Rugby Club would experience close range, significant adverse visual effects associated with the completed A47 link of the Main HNRFI Site which wraps around this group.

11.188 Dwellings located at the edge of the elevated settlements of Barwell and Earl Shilton

would potentially have distant views over the Main HNRFI Site (representative Photoviewpoint 25 and 26). There would be significant adverse effects as a result of the completed B8 buildings, which would introduce built form across the previously agricultural landscape, whilst views of the A47 Link Road works and area of POS adjacent to the Country Park would also be possible.

Public rights of way and open access land

11.189 As shown on Figure 11.3, a number of footpaths/bridleways traverse the Main HNRFI Site and the study area. Figure 11.9 illustrates the locations of the Photoviewpoints. Figure 11.10, Photoviewpoints 1, 2, 3, 4, 5, 6, 8 and 37 illustrate views from sections of PRoW across the Main HNRFI Site. Most of these routes will be diverted or extinguished. Throughout the evolution of the project, the maintenance of PRoW connections across the Main HNRFI Site for a range of users has been a consideration, informing the Illustrative master plan through a Public Rights of Way Strategy (Figure 11.14). Upon completion, there will largely be a new PRoW network established around the Main HNRFI Site to continuing previous onward connections whilst providing betterment in the form of surfaced routes and removal of gates and stiles.

11.190 Unsurprisingly there would be a wholesale adverse visual change to the previous alignments of PRoW across Main HNRFI Site which include:

- Footpath U50 (Photoviewpoint 2 and 6);
- Footpath U52 (Photoviewpoint 3 and 4);
- Footpath V22;
- Footpath V23 (Photoviewpoint 5);
- Footpath V35 (Photoviewpoint 1);
- Bridleway U52 (Photoviewpoint 4);
- Bridleway V29 (Photoviewpoint 8 and 37); and
- Bridleway U9.

11.191 Beyond the confines of the Main HNRFI Site, other PRoW that have the potential to experience significant effects during Year 1 of completion include:

- Footpath U53 (Photoviewpoint 9);
- Footpath V52 (Photoviewpoint 42);
- Bridleway U52 (Photoviewpoint 17);
- Bridleway V29 (Photoviewpoint 21); and

- Footpath V23 (Photoviewpoint 47).

11.192 In terms of PRoW likely to experience potential significant effects related to Year 1 completion of off-site highways works, these include:

- Footpath U8 (highways modification HB4);
- Footpath U52 (highways modification HB4);
- Bridleway U11 (highways modification HB4); and
- Footpath U17 (highways modification B8).

11.193 In terms of the A47 Link Road, none of the PRoW that experienced potential significant effects at construction is considered to experience potential significant adverse effects related to Year 1 of completion.

11.194 With regard to the Leicestershire Round, despite the close proximity in which part of this route falls adjacent to the western edge of the Main HNRFI Site, only a short section (c.200m) may experience views of upper levels of completed B8 buildings to the east above existing mature vegetation. The level of effect would diminish with distance and the influence of intervening screening such as vegetation, buildings and topography such that, on the Leicestershire Round as a whole, the magnitude of change to views will be very low, leading to a minor adverse effect which is not significant.

11.195 In terms of open access land, there would continue to be significant adverse effects at locations within Burbage Common and Woods Country Park (Photoviewpoint 36, 42, 43 and 44). Effects at Photoviewpoint 43 and 44 would be twofold, as views eastwards will comprise elements of the completed B8 buildings, whilst views northwards would include the completed A47 Link Road, with the extensive area of land sandwiched between it and Burbage Common Road that will become an area of recreational public access that will be naturalistic in character, forming an informal area of POS adjacent to Burbage Common and Woods Country Park. This would result in a significant beneficial effect.

Public highways

11.196 During Year 1 of completion, there would be potential (worst case) major/moderate significant adverse effects experienced on Burbage Common Road. This route where it passes through the Main HNRFI Site will have been entirely removed and replaced by commercial B8 buildings and associated infrastructure integral to the Main HNRFI Site. Users on this route travelling south from the B581 will now be met with a dead-end whilst there would be views in a southern direction towards the warehouse units which appear against a backdrop of Burbage Wood, Aston Firs and Freeholt Wood (Photoviewpoint 7). Woodland planting at the northern edge of the Main HNRFI Site will still be young and provide little filtration of the proposals and users of this road would have close range open views of the Proposed Development. In terms the western end of Burbage Common Road which will be retained, becoming a no through road to traffic with a turning head, whilst

pedestrian, equestrian and cyclists will be able to carry on towards the Main HNRFI Site. Views north of the western extent of Burbage Common Road would also experience significant close range beneficial effects through the creation of a newly planted area of open access land adjacent to Burbage Common and Woods Country Park. This western edge of the route will largely retain its country lane character as a result, whilst there may be glimpses of B8 buildings and Railport infrastructure when travelling eastwards towards the Main HNRFI Site.

11.197 For users of the M69 motorway, close-range, oblique, glimpsed views of the B8 buildings and immature boundary landscape treatments would be possible as users pass the eastern boundary of the Main HNRFI Site. These views are likely to be less intrusive and stark than at construction. Glimpsed significant adverse effects are likely to be experienced by road-bourne receptors when immediately passing the Main HNRFI Site, which would reduce rapidly beyond it.

11.198 In terms of the completed works required to other roads within the DCO Order Limits relating to off-site highways, these are unlikely to result in significant effects upon users of those routes due to the likely limited nature of the works (e.g. signage, road calming measures).

11.199 Elsewhere within the 2km detailed study area there might be occasional glimpses towards the completed Main HNRFI Site from the surrounding road network. However, in most instances these would be, oblique, glimpsed views that would be largely interrupted by a combination of topography, mature vegetation and/or built form that would limit the potential for significant adverse effects.

Railways

11.200 Upon completion, there would be potential significant, if transient, adverse effects for rail passengers passing through the Main HNRFI Site, obtaining oblique, open views over much of the Main HNRFI Site and the A47 Link Road west of the railway line.

11.201 Beyond the immediate bounds of the DCO Order Limits, there is unlikely to be significant adverse effects upon receptors due to the transient, oblique, glimpsed nature of views that are generally limited by embankments and or/mature vegetation within the landscape.

PROPOSED MITIGATION

Mitigation and enhancement

11.202 Inherent mitigation provides a form of preventative mitigation and is that which has been considered as an integral part of the overall design for the landscape strategy. It is not an ‘add-on’ or ‘band-aid’ measure to ameliorate significant environmental effects, but part of the positive and pro-active approach whereby mitigation has been assessed and

considered at all stages of the development of the project.

11.203 The Proposed Development benefits from existing dense mature woodland to the south of the Main HNRFI Site which provides a natural screen to views from the south, whilst the north-western edge of the Main HNRFI Site will incorporate a bund, planted with woodland species to assist in softening views from the west and north. The northern edge of the Main HNRFI Site will include further areas of woodland planting whilst the areas adjacent to the M69 will feature a new Bridleway route that will be planting with a mixture of woodland, shrub and scrubby species. Further, areas between the Main HNRFI Site and Burbage Common and Woods Country Park would be laid out as additional naturalistic public access land.

11.204 The Landscape and Public Rights of Way strategy is a key component of the Proposed Development. As illustrated through the Illustrative Landscape Strategy (Figure 11.15), Masterplan and Parameters Plan, the Proposed Development incorporates green infrastructure, public open space (both formal and informal) and landscape enhancements.

11.205 The Landscape Strategy has been conceived and designed with reference to published Landscape Character Assessments as well as site-specific advice regarding landscape and visual matters, thus ensuring mitigation proposed accords with Local Authority policy guidance.

11.206 Those mitigation measures pertinent to landscape and visual (and arboricultural) matters are explained with reference to the different stages of the Proposed Development below.

Demolition and construction

11.207 The following measures would be implemented during the construction phase of the Proposed Development:

- the adoption of an approved Construction and Environment Management Plan (CEMP) including mitigation designed to avoid significant ecological effects including those on key landscape features, would be secured through a DCO Requirement. Also included would be the phasing and detailing of landscaping, provision of earthworks and drainage. This CEMP will be approved by the relevant local planning authority prior to the commencement of development and would be substantially in accordance with the measures set out in an outline CEMP, submitted with the DCO application;

- a Construction Method Statement (CMS) would also be secured through a DCO Requirement, setting out the indicative construction methodologies, works, machinery and procedures required to build the Proposed Development. It would describe at a high level how the Proposed Development will be constructed and sets out the overall programme and phasing of works. This CMS will be approved by the relevant local planning authority in accordance with a DCO Requirement and would be substantially in accordance with the measures set out in an outline CMS, submitted

with the DCO application;

- the adoption of an approved Arboricultural Method Statement (AMS) incorporating best practice guidance set out in British Standard 5837: 2012 *'Trees in Relation to Design, Demolition and Construction'* which will ensure retained trees and other vegetation is not adversely affected during the construction process;

- the adoption of an approved topsoil and earthworks management plan (Soil Management Plan), including dust control measures would be secured via a DCO Requirement. The Soil Management Plan would include measures to protect and enhance soil for biodiversity purposes and for the establishment of landscaping;

- the use of visual screening, such as hoardings for more sensitive visual receptors in proximity to the Application Site, including residential receptors that have the greatest potential to be affected by the Proposed Development, as set out in Appendix 10.1;

- existing residents that live adjacent to Main HNRFI Site (particularly those to the north and west on Burbage Common Road) would be more sensitive to construction lighting due to the proximity, direction and type of receptor. Mitigation measures for construction lighting are likely to include directional fittings. Where work is required outside of daylight hours, temporary lighting would be directed away from retained watercourses, woodlands, mature trees and hedgerows. The outline Construction Environmental Management Plan and the Lighting Statement will provide further detail in respect of temporary construction lighting. All these documents will be secured as a requirement of the DCO; and

- as shown on Figure 11.3, there are a number of PRoW crossing the Main HNRFI Site. Safe access for pedestrians would need to be maintained whenever practicable throughout the construction phases of development of the Main HNRFI Site, A47 Link Road and off-site highways. Access along retained PRoWs should be protected using Heras fencing, hoardings or similar. Many routes across the Main HNRFI Site will be closed up or diverted in order to deliver the Proposed Development. Construction works that create dust would be kept to a minimum close to the PRoWs, and dust prevention measures, such as damping, would be undertaken to reduce the impact on users of the PRoW network.

11.208 Generally, the landscape and visual effects during the construction phases of the Proposed Development would be difficult to mitigate entirely due to the nature of these operations. However, as described above, the adoption of approved best practice construction methods will aid in reducing the perception of construction activities for those receptors most likely to be affected.

11.209 Notwithstanding the adoption of these measures, and whilst the significance of the effect at some receptors would reduce to a limited degree, no receptor experiencing a significant unmitigated effect would experience a reduction to a non-significant level of effect as a result of construction mitigation.

11.210 The critical consideration in the assessment of construction effects is their temporary nature, and thus the medium term time period for which landscape and visual amenities would be affected to a significant degree.

11.211 It should also be noted that the construction phase would not be a singular phase of construction where the whole draft Order Limits are under construction for a 10-year span. In reality, there would be a number of phases of construction, by where parts of the Proposed Development and landscape mitigation would be completed before others. Such that is the case that by 'Year 1' of full operation of the entire Proposed Development, parts of the Landscape Strategy planted in the early stages of the 10-year construction phase timespan would already have matured and provided benefit.

Operation

11.212 Mitigation during the operational (post-completion) stage comprises embedded (avoidance) mitigation and additional mitigation proposed to reduce the significance of likely effects (reduction mitigation). These different mitigation measures are explained below with reference to the proposed development.

Embedded mitigation

11.213 The Main HNRFI Site currently comprises a series of small to medium scale regular agricultural fields enclosed by a network of hedgerows and occasional hedgerow trees, and is influenced across its eastern boundary by the M69 and on its north-western boundary by the Leicester to Hinckley railway.

11.214 Despite the unavoidable loss of some enclosed farmland, the current condition and key characteristics of the landscape have been considered throughout the design of the Proposed Development and integrated into the landscape strategy where possible, such as the nearby character of the Burbage Common and Woods Country Park which has been considered on the design of the area south of the A47 Link Road and the western extent of the Main HNRFI Site.

Additional mitigation

11.215 The landscape and visual mitigation strategy is a key component of the Proposed Development. As shown on the illustrative masterplan, parameter plan and DAS for the Main HNRFI Site, the Proposed Development incorporates public open space and other landscape enhancements which include:

- an over-arching Illustrative Landscape Strategy (Figure 11.15) for the Main HNRFI Site;
- the provision of a retained, albeit realigned and upgraded on-site PRoW network across the Main HNRFI Site (Figure 11.14), offering recreational value, and a community resource; and
- the creation of surface water attenuation and detention features incorporated within

the areas of open space.

11.216 In addition to these site-wide measures, around the edges of the HNRFI, the landscaping will be managed and reinforced to contain the development, providing site security, screening and habitat enhancement.

11.217 As part of the wider green infrastructure, public open spaces, both formal and informal, will be designed to provide high-quality and traffic free green spaces, which satisfies a number of objectives, including:

- provision of an on-site PRoW network which maintains connectivity across the Main HNRFI Site, including the creation of a new route; and
- public open space for formal and informal use, whilst also contributing to green networks and enhancing habitat connectivity through the provision of a landscaped corridor along the eastern edge of the Main HNRFI Site, the A47 Link Road (sandwiched between the road and Burbage Common) and located in the western end of the Main HNRFI Site.

11.218 In summary, the landscape elements specific to the detailed design of the proposals include enhancements that would provide:

- visual filtering of the Proposed Development;
- public and private amenity; and
- ecological value.

RESIDUAL ENVIRONMENTAL EFFECTS

Following completion at year 15

11.219 The following is an assessment of the residual effects of the Proposed Development following mitigation employed during the construction phase (to reduce the effects of construction activities) and after completion, at Year 15 post full completion, once embedded mitigation measures have matured.

11.220 The 'residual' effects of the scheme are considered to be those that persist once the effects of mitigation – be that strategic planting or the softening of the Proposed Development provided by planting and areas of open space – have become established. In planning terms, these are the effects to which most 'weight' should be attached, since they represent the long-term effect on the landscape and visual baseline.

11.221 The residual effects following the implementation of the mitigation strategies will be assessed in further detail in the ES that will accompany the DCO submission. Only those residual effects that have reduced and/or ameliorated likely significant effects as

described above are discussed below; all other effects as stated at Year one would remain the same.

Landscape character

Landscape character areas

11.222 With regard to broader the published landscape character areas, the potential effects predicted upon those areas which cover or lie in close proximity to the DCO Order Limits at Year 15 of completion are detailed in Table 11.15 below.

Table 11.15: Potential operation effects at year 15 on published landscape character.

Landscape	Sensitivity	Effect
Blaby Landscape Character Areas		
LCA 1: Aston Flamville Wooded Farmland	Very High (large scale commercial) Medium (transport infrastructure)	Major Significant Minor/Negligible Not Significant
LCA 3: Cosby Agricultural Parkland	Medium (transport infrastructure)	Minor/Negligible Not Significant
LCA 5: Croft Hill and Quarries	Medium (transport infrastructure)	Minor/Negligible Not Significant
LCA 6: Elmesthorpe Floodplain	Very High (large scale commercial)	Moderate Significant
LCA: 15 Stoney Stanton Rolling Farmland	Low (transport infrastructure)	Negligible Not Significant

Landscape	Sensitivity	Effect
Hinckley and Bosworth Landscape Character Areas		
Burbage Common Rolling Farmland	Medium (transport infrastructure)	Minor Not Significant
Hinckley (UCA)	Very Low (transport infrastructure)	Negligible/None Not Significant

11.223 Following completion, and as mitigation measures have matured c.15 years from completion, the magnitude of change expected upon the Aston Flamville Wooded Farmland LCA would remain as high and an effect of major and significant adverse and permanent.

11.224 With regards to the Elmesthorpe Floodplain LCA, a reduction from high (Year 1) to medium (Year 15) is expected, leading to an overall effect of moderate and significant and adverse. However, it should be noted that the maturation of the area south of the A47 Link Road will have altered in character over time to one more consistent with the adjoining LCA to the south (Burbage Common Rolling Farmland).

11.225 In terms of the Burbage Common Rolling Farmland LCA itself, this contribution is likely to have a beneficial effect, increasing the area in which the character is exhibited. Effects at Year 15 are still considered to be minor, permanent and not significant, but they are also considered to be beneficial.

11.226 The very limited, neutral effects upon Cosby Agricultural Parkland, Croft Hill and Quarries, LCAs and Hinckley UCA at Year 1 would remain at Year 15 and would not be significant.

Landscape character of the main HNRFI site

11.227 Following completion, and as mitigation measures mature c.15 years from completion, the magnitude of change would reduce slightly. However, given the degree and permanence of change (from agricultural fields to a SRFI), the level of effect would remain major/moderate adverse and significant, resulting from a medium sensitivity and a very high magnitude of change.

Landscape character of the A47 Link Road corridor

11.228 The fieldscape character of A47 Link Road corridor will have transformed from agricultural

farmland to a Link Road embanked on either side, whilst to the south of the A47 Link Road itself, the field structure would remain intact with field boundaries retained as far as practically possible, as would the scattered mature hedgerow trees. The area will have been transformed from an agricultural fieldscape to one comprising newly planted trees, areas of scrub (Figure 11.15), meadow grassland, providing GI links to the woodland to the east and to the existing Country Park to the south. There would be a high change that would be significant, although it would be beneficial and permanent in nature.

Landscape character of the off-site highways and junctions

11.229 By Year 15, there would still be a very low magnitude of change to these areas, resulting in a neutral effect of negligible/none, which would be insignificant.

Visual amenity

11.230 Locations of representative receptor photoviewpoints are illustrated on Figures 11.9. The photoviewpoints themselves are provided as Figure 11.10. Receptor sensitivity is described in Table 11.16 with the sensitivity of visual receptors varying according to category, context of the view and susceptibility to change. Modelled views of the scheme parameters are contained within Figure 11.16, in which it should be noted that these views represent the scheme parameters within which built development will be placed and do not represent the scheme layout which would comprise the rail port and a series of units with landscape planting and open space within the parameters shown. The potential effects at Year 1 of completion predicted for each receptor is included in Table 11.16 below.

Table 11.16: Potential operational effects at year 15 on visual receptor groups.

Photoviewpoint numbers	Receptor and location	Sensitivity	Effect
Residences and Settlements			
-	Residents at Aston Firs Campsite	Very High	Major Adverse Permanent Significant
-	Residents at Averley Farm	Very High	Major/Moderate

Photoviewpoint numbers	Receptor and location	Sensitivity	Effect
	House		Adverse Permanent Significant
-	Residents at Bridge Farm	Very High	Moderate Adverse Permanent Significant
17	Residents at Billington Rough	Very High	Moderate/Minor Adverse Permanent Not Significant
3	Residents at Wood House Farm	Very High	Major Adverse Permanent Significant
20, 21	Residents at Oaklands	Very High	Moderate Adverse Permanent Significant
22	Residents at Station Road	Very High	Major/Moderate Adverse

Photoviewpoint numbers	Receptor and location	Sensitivity	Effect
			Permanent Significant
7	Residents at Burbage Common Road	Very High	Major Adverse Permanent Significant
-	Residents at Burbage Common Road west	Very High	Major Beneficial Permanent Significant
26	Residents at Barwell	Very High	Major/Moderate Adverse Permanent Significant
25	Residents at Church Lane, Dovecote way, St Mary's Close and Barwell Lane, Barwell	Very High	Major/Moderate Adverse Permanent Significant
9	Residents at Highgate Lodge Farm and Red Hill Farm	Very High	Moderate/Minor Adverse Permanent

Photoviewpoint numbers	Receptor and location	Sensitivity	Effect
			Not Significant
40	Residents at Earl Shilton	Very High	Moderate/Minor Adverse Permanent Not Significant
46	Residents at B4668 between Burbage Common Road and A47	Very High	Moderate/Minor Neutral Permanent Significant
-	Residents at Gypsy and traveller settlement off Smithy Lane	Very High	Major Adverse Permanent Significant
-	Residents at Gypsy and traveller camp off B4668	Very High	Major Adverse Permanent Significant
Public Rights of Way, National Cycle Routes and Open Access Land			
-	Leicestershire Round	High	Minor Adverse

Photoviewpoint numbers	Receptor and location	Sensitivity	Effect
			Permanent Not Significant
-	Footpath T89 (between Wentworth Arms Pub and the A47, east Elmesthorpe)	High	Moderate/Minor Adverse Permanent Not Significant
-	Footpath U8 (Outwoods rail crossing (modification HB4)	High	Moderate/Minor Adverse Permanent Not Significant
-	Footpath U17 (Thorney Fields Farm rail crossing (modification B8)	High	Moderate/Minor Adverse Permanent Not Significant
-	Footpath U20 (between Station Road/B581 and A47, Elmesthorpe)	High	No Change Neutral Permanent No Effect
-	Footpath U49 (Burbage Common and Woods Country Park)	High	Minor Adverse Permanent

Photoviewpoint numbers	Receptor and location	Sensitivity	Effect
			Not Significant
2, 6	Footpath U50 (links Billington Rough with Aston Firs)	High	Major Adverse Permanent Significant
3, 4	Footpath U52 (links Burbage Common Road bridge with Burbage Common and Woods Country Park)	High	Major/Moderate Adverse Permanent Significant
9	Footpath U53 (east of Main HNRFI Site, passing Red Hill Farm, connecting to Sapcote)	High	Major/Moderate Adverse Permanent Significant
14	Footpath U63 (between Aston Flamville and Burbage)	High	No Change Neutral Permanent No Effect
-	Footpath V22 (near Hissar Farm House on A47 Link Road)	High	Minor Adverse Permanent Not Significant

Photoviewpoint numbers	Receptor and location	Sensitivity	Effect
5	Footpath V23 (travels northwest from Burbage Common Road within Main HNRFI Site to B4668)	High	Major/Moderate Adverse Permanent Significant
-	Footpath V30 (Along M69 south of Main HNRFI Site near Aston Flamville)	High	Minor Adverse Permanent Not Significant
1	Footpath V35 (Between M69 Junction 2 and Burbage Common Road bridge)	High	Major/Moderate Adverse Permanent Significant
-	Footpath V36 (West of Aston Flamville)	High	No Change Neutral Permanent No Effect
-	Footpath V37 (Heads north from Aston Flamville)	High	Minor Adverse Permanent Not Significant

Photoviewpoint numbers	Receptor and location	Sensitivity	Effect
22	Footpath V49 (Links south of Stoney Stanton to Hinckley Road near Averley House Farm)	High	Minor Adverse Permanent Not significant
-	Bridleway U11 (Outwoods rail crossing (modification HB4) to Hinckley)	High	Moderate/Minor Adverse Permanent Not Significant
-	Bridleway U51 (Burbage Common and Woods Country Park)	High	Minor Adverse Permanent Not Significant
17, 18	Bridleway U52 (Between Elmesthorpe and Bridge Farm)	High	Moderate Adverse Permanent Significant
8, 11, 21, 37	Bridleway V29 (Between Freeholt Lodge, Huncote Road north Sapcote and Aston Lane west Sharnford)	High	Major/Moderate Adverse Permanent Significant to Minor

Photoviewpoint numbers	Receptor and location	Sensitivity	Effect
			Adverse Permanent Not significant
15, 36, 43, 44	Burbage Common Country Park	High	Moderate Adverse Permanent Significant to Moderate/Minor Adverse Permanent Not Significant
Public Highways			
8, 12, 13, 20, 28,	M69 Motorway	Very Low	Minor Neutral Permanent Not Significant
10, 29	B4669	Low	Minor Neutral Permanent Not Significant to Minor/Negligible

Photoviewpoint numbers	Receptor and location	Sensitivity	Effect
			Neutral Permanent Not Significant
20, 21, 47, 48	B581	Low	Minor/Negligible Neutral Permanent Not Significant
-	A47	Low	No Effect Neutral Permanent Not Significant
45, 46	B4668	Low	Negligible Adverse Permanent Not Significant
4, 7, 16	Burbage Common Road	Medium	Moderate Beneficial Permanent Significant
22	Stanton Lane	Medium	Minor/Negligible Adverse

Photoviewpoint numbers	Receptor and location	Sensitivity	Effect
			Permanent Not significant
-	Smithy Lane	Medium	Minor/Negligible Adverse Permanent Not Significant
12	Aston Lane	Medium	Minor/Negligible Adverse Permanent Not significant
13	Lychgate Lane	Medium	Minor/Negligible Adverse Permanent Not significant
28	Pingle Lane	Medium	Minor/Negligible Adverse Permanent Not significant
27	Thurlastone Lane	Medium	Minor/Negligible Adverse Permanent

Photoviewpoint numbers	Receptor and location	Sensitivity	Effect
			Not significant
38	Mill Lane	Medium	Minor/Negligible Adverse Permanent Not Significant
Railways			
4, 5	Leicester to Hinckley Railway	Very Low	Minor Permanent Adverse Not Significant

Homes and settlements

11.231 Following completion of the Proposed Development and as mitigation measures mature, by Year 15 the magnitude of change would marginally reduce for the majority of residential receptors, reflecting the maturity of the scheme mitigation and the benefit of the early establishment of strategic planting belts along the eastern boundary and the northern edge of railway of the Main HNRFI Site.

11.232 During Year 15 of completion there would continue to be potential significant adverse effects for a number of dwellings in close proximity to the Main HNRFI Site, including Aston Firs Campsite (off Smithy Lane) and the adjacent Gypsy and traveller site, due to their proximity to the main entrance to the Main HNRFI Site which will feature the newly completed exit off the M69 Junction 2. Views north from this group would comprise warehouse units and internal infrastructure integral to the Main HNRFI Site which will also result in a significant adverse effect upon northern views from these groups of dwellings. The Landscape Strategy (Figure 11.15) by this stage will have matured to a stage that will filter and partially screen the lower elements of the scheme. Whilst this may reduce the level of effect, the overall proximity to the Main HNRFI Site to these receptors is such that there would still be a significant effect.

11.233 Upon completion, along Burbage Common Road (Photoviewpoint 1), the northern extent of the route will have changed from a through road to providing vehicular access only to residents along it. However, pedestrians, equestrian users, cyclists and emergency vehicles will still have access through the northern edge of the Main HNRFI Site. Views from dwellings southwards towards the Main HNRFI Site are likely to comprise horizontal built form of B8 buildings across most of the view, whilst woodland planting at the northern extent of the Main HNRFI Site will have reached maturity, softening views in this direction. The effects will have reduced, but they would remain significant effects, permanent and adverse upon this group.

11.234 Dwellings at the western end of Burbage Common Road, (located at the northern extent of the Country Park) would have oblique limited views of the upper storeys of B8 buildings and cranes associated with the HNRFI to the east. Existing vegetation and the earth bund with woodland along the northern edge of the railway would provide filtering of views, reducing the adverse visual effects arising from the Main HNRFI Site which would not be significant. In terms of the foreground view from these dwellings the completed A47 Link Road would be hidden due to its low-lying nature, whilst the area of proposed POS adjacent to Burbage Common and Woods Country Park will have matured to a state that would provide a naturalistic, attractive character with open access, with maturing vegetation providing a further containment of views toward the HNRFI. This would result in significant beneficial effects that would be permanent in nature. Dwellings located at the very western end of Burbage Common Road, adjoining the B4668 would experience no significant effects as a result of either the Main HNRFI Site, A47 Link Road or off-site highways by Year 15.

11.235 In terms of Bridge Farm significant adverse visual effects would remain due to its proximity to the Proposed Development, which would remain visible in views from the east, south and west of the dwelling. Whilst views eastwards will have become softened over time due to the proposed bund, on which maturing trees will have established, there would still be views of B8 buildings and the Railport. Views south and west, new area of POS adjacent to the Country Park (part of the A47 Link) will have matured and embedded with the landscape, whilst the A47 link road (enclosed by embankments) will be limited from views.

11.236 Averley Farm House is likely to experience potential significant adverse effects at close range as a result of completion of development at the Main HNRFI Site which would comprise the upgrading of M69 Junction 2 and a number of large B8 buildings across a previously agricultural landscape. Whilst proposed landscaping will have matured, effects are likely to remain significant and adverse.

11.237 In terms of dwellings at Billington Rough, views of large scale B8 buildings and the Railport to the south and south-west would likely result in significant adverse effects, despite continued growth of mature vegetation within the landscape.

11.238 Wood House Farm would continue to have views towards the Main HNRFI Site, although for the most part would be filtered, if not screened (see Photoviewpoint 42). Further maturation of vegetation in the Country Park as part of the landscape strategy are likely to reduce the adverse visual effect by Year 15 to a level that would not be significant.

11.239 In terms of the dwelling at Oaklands, maturation of vegetation within the landscape will have softened views in the direction of the Main HNRFI Site, reducing the effects to a level that would not be significant.

11.240 The two dwellings Station Road will experience a reduction in the level of effect due to the maturation of woodland planting at the northern extent of the Main HNRFI Site. However, these views would still remain significant, adverse and permanent in nature.

11.241 The Gypsy and traveller site located opposite Hinckley Rugby Club would continue to experience close range, significant adverse visual effects associated with the A47 link.

11.242 Dwellings located at the edge of the elevated settlements of Barwell and Earl Shilton would have distant views over the Main HNRFI Site (representative Photoviewpoint 25 and 26). There would be significant adverse effects as a result of the completed B8 buildings which would introduce built form across the previously agricultural landscape, whilst views of the A47 Link Road and the area of POS adjacent to the Country Park would also be possible.

11.243 It should be noted that a finding of significant effects results primarily from the assignation of a very high sensitivity for such receptors, rather than a large degree of predicted change, which in a visual amenity sense would (if it occurred) be subject to greater materiality, due to the greater likelihood for an overbearing effect.

Public rights of way and open access land

11.244 Following completion, and as mitigation measures mature, by Year 15 the magnitude of change would generally reduce for the PRoW network, whilst those within the Main HNRFI Site and within particularly close proximity to it would remain the same. As illustrated on Figure 11.14, a number of footpaths/bridleways that traverse the Main HNRFI Site will have been extinguished or diverted, however, the strategy ensures that connectivity around the Main HNRFI Site is retained via a new dedicated link.

11.245 By Year 15, the new PRoW network established around the Main HNRFI Site will have matured along with the landscaping associated along those corridors.

11.246 Due to the loss, diversion and alteration of the below routes as a result of development at the Main HNRFI Site, there would be a wholesale adverse visual changes which would be significant to the following PRoW:

- Footpath U50 (Photoviewpoint 2 and 6);
- Footpath U52 (Photoviewpoint 3 and 4);
- Footpath V22;
- Footpath V23 (Photoviewpoint 5);
- Footpath V35 (Photoviewpoint 1);

- Bridleway U52 (Photoviewpoint 4);
- Bridleway V29 (Photoviewpoint 8 and 37); and
- Bridleway U9.

11.247 Beyond the confines of the Main HNRFI Site, other PRoW that have the potential to experience significant effects during Year 15 of completion include:

- Footpath U53 (Photoviewpoint 9);
- Footpath V52 (Photoviewpoint 42);
- Bridleway U52 (Photoviewpoint 17);
- Bridleway V29 (Photoviewpoint 21); and
- Footpath V23 (Photoviewpoint 47).

11.248 Whilst there might still be significant adverse effects upon the above routes by Year 15, the landscape strategy encompassing the Main HNRFI Site will have, over time matured to soften views in the direction of the HNRFI.

11.249 In terms of the A47 Link Road and off-site highways, none of the retained PRoW that experienced potential significant effects at construction or Year 1 of completion is considered to experience potential significant adverse effects related to Year 15 of completion.

11.250 In terms of Burbage Common and Woods Country Park, the level of effect would reduce over time due to maturation of intervening existing and planted vegetation (as part of the landscape strategy). However significant adverse effects at locations within the Country Park (Photoviewpoint 36, 42, 43 and 44) will occur where glimpses of warehouse units will still be possible in what was otherwise a rural location. Effects at Photoviewpoint 43 and 44 would be twofold, as views eastwards will comprise elements of the completed B8 buildings, whilst views northwards would comprise views towards the completed A47 Link but also the extensive area of land sandwiched between it and Burbage Common Road that will have matured into an attractive landscape for recreational public access, forming a complimentary addition Burbage Common and Woods Country Park. This would result in a significant beneficial effect.

Public highways

11.251 During the construction phases and early life of the Proposed Development, due to its closure, there would be significant adverse effects on Burbage Common Road. Generally, by Year 15, the magnitude of change would reduce slightly for road receptors on this route due maturation of proposed vegetation over this time period which softens views and partially screens the Main HNRFI Site. The previously very high change would reduce to high, leading to a moderate effect which is still significant. Over the longer term, and as

the development becomes an accepted part of the view from these roads, references to magnitude of change and levels of effect would become irrelevant in the local context.

11.252 For the remaining road network, where screening, the existing character of views and the low sensitivity generally of road receptors plays an important role in limiting effects, there would be no residual significant effects.

CUMULATIVE AND IN-COMBINATION EFFECTS

11.253 Cumulative effects can arise from the intervisibility of operational or proposed developments and/or from the combined effects of individual components of the Proposed Development occurring in different locations or over a period of time. The separate effect of such individual components or developments may not be significant, but together they may create a degree of adverse effect on the landscape resource or visual receptors within their combined visual envelopes. In this cumulative assessment, the focus is on the additional effects of the Proposed Development. Baseline schemes may have significant effects in their own right, but significant cumulative effects do not automatically arise following the addition of the Proposed Development; the significance is determined by the degree of change that the Proposed Development would introduce into the theoretical cumulative baseline.

11.254 Cumulative effects arise in two principal ways – in combination and sequentially. Combined effects occur when: 1) two or more schemes appear simultaneously in the same arc of view without the need for an observer to turn; and 2) in succession, where it is necessary for the observer to turn the head to see the various schemes. Sequential effects occur where the observer has to move from one location to another to be able to see the different developments, and typically arise when the observer is travelling through a landscape.

11.255 Those cumulative development sites within the near vicinity of the Proposed Development (see Figure 20.1), which have the potential to result in cumulative landscape and visual effects, will be assessed against the likely LVIA effects of the Proposed Development to determine whether cumulative effects are likely and if so their significance. This will be reported in the ES.

CLIMATE CHANGE

11.256 The impact of climate change on the landscape and visual resource is assessed through consideration of a potential future baseline scenario and considers how potential climate change might alter the predicted landscape and visual effects reported in this chapter. Whilst it is unlikely that completely new direct impacts would arise as a result of climate change based on the current conditions, the geographic spread or scale of potential impacts might be changed when considered against the future baseline conditions.

11.257 The changes to temperature and precipitation predicted would be likely, in time, to change the landscape around us, in a number of ways. However, it is unlikely that this would lead to wholescale change to the future landscape baseline within the lifetime of the Proposed Development. Changes might include certain tree species or grasslands becoming more dominant/prevalent. Changes to the landscape effects predicted are therefore considered appropriate.

11.258 For visual effects, the future baseline under a climate change scenario would not lead to any greater, or different, effects to those predicted.

SUMMARY AND CONCLUSIONS

11.259 The LVIA baseline report (PEIR Appendix 11.1) provides a preliminary appraisal of the baseline conditions against which landscape and visual effects can be considered as the design of the Proposed Development at the Project Site evolves.

11.260 In landscape and visual terms, the preliminary impact assessment indicates that the greatest scope for significant permanent effects relates to the construction and early years of the operational phase of the Proposed Development. This will be subject to further assessment involving more detailed visual studies (supported by photomontage visualisations to provide accurate visual representations of the proposals from key photoviewpoints). The results of this assessment will be presented in the ES which will form part of the application for the Proposed Development.

11.261 The Proposed Development is likely to considerably and permanently change the existing landscape in which it is sited. With regard to the Main HNRFI there would likely be residual significant adverse landscape and visual effects across a number of host LCAs, and nearby visual receptors.

11.262 In regard to the land south of the A47 Link Road, on the basis of the proposed landscape and ecological mitigation strategies, it is considered that the overall residual effects upon the landscape fabric and features of this area would be beneficial, including enhancement of existing areas of ecological habitats as well as the creation of newer areas.

11.263 This preliminary assessment of the potential landscape and visual effects of the construction and operation phases of the Proposed Development, mitigation measures and residual effects are not exhaustive but are considered to provide as comprehensive an overview as possible as this stage in the project process.

Tritax Symmetry (Hinckley) Limited

HINCKLEY NATIONAL RAIL FREIGHT INTERCHANGE

Preliminary Environmental Information Report

Chapter 12: Ecology and biodiversity

January 2022

This document forms a part of a Preliminary Environmental Information Report (PEIR) for the Hinckley National Rail Freight Interchange project.

A PEIR presents environmental information to assist consultees to form an informed view of the likely significant environmental effects of a proposed development and provide feedback.

This PEIR has been prepared by the project promoter, Tritax Symmetry (Hinckley) Limited. The Proposed Development is described in Chapter 3 of the PEIR and is the subject of a public consultation running from 12 January to 9 March 2022.

Details of how to respond to the public consultation are provided at the end of Chapter 1 of the PEIR and on the project website:

http://www.hinckleynrfi.co.uk/

This feedback will be taken into account by Tritax Symmetry (Hinckley) Limited in the preparation of its application for a Development Consent Order for the project.

Chapter twelve ◆ Ecology and Biodiversity

INTRODUCTION

12.1 This chapter has been prepared by The Environmental Dimension Partnership Ltd (EDP) and assesses the likely significant effects of the Proposed Development on features of nature conservation value. In particular, it considers the likely effects of the Hinckley National Rail Freight Interchange (HNRFI) Proposed Development on the Important Ecological Features (IEFs) identified through the Ecology Baseline Report, which is included as Technical Appendix 12.1.

12.2 It has been prepared with reference to The Chartered Institute of Ecology and Environmental Management's (CIEEM) Ecological Impact Assessment (EIA) Guidelines (CIEEM, 2019). The chapter has been prepared and reviewed by experienced senior EDP Ecologists and full members of CIEEM.

12.3 For reasons of clarity, and due to the quantity of baseline ecological information collated during the assessment, the detailed methods and results are provided in Technical Appendix 12.1. A preliminary Biodiversity Impact Assessment (BIA) is also provided in Technical Appendix 12.2**.**

12.4 This chapter describes the methods used for the assessment, a summary of the baseline conditions currently existing within the Main Order Limits and in its surroundings, the likely direct and indirect effects arising from the Proposed Development during construction and operation, and the mitigation measures required to avoid, mitigate or compensate likely significant adverse effects. It also provides an assessment of the potential opportunities to provide enhancements over the existing situation with likely significant beneficial effects.

12.5 Unless stated otherwise, this chapter and the accompanying Technical Appendices present baseline information and assess impacts relating to the Main Order Limits, namely the Main HNRFI Site together with the corridor of a proposed link road to the B4668/A47 Leicester Road (the 'A47 Link Road'), proposed works to M69 Junction 2 and a section of the B4669 Hinckley Road towards the village of Sapcote. Most of the land contained within the Development Consent Order (DCO) Site but outside the Main Order Limits is located at some distance from the Main Order Limits, these are generally off-site existing highway junction and rail crossings and are of limited or negligible ecological importance, however these will be considered fully in the Environmental Statement (ES) Chapter.

METHODOLOGY AND DATA SOURCES

Previous assessment

12.6 There is no known previously prepared EIA for the Proposed Development. However, EDP prepared early environmental representations in respect of ecology and biodiversity related environmental matters, and the ecological baseline desk and field-based surveys (see Technical Appendix 12.1) were undertaken between 2016 and 2021 i.e., prior to and during the design of the Proposed Development.

12.7 This approach has ensured that the ecological and biodiversity sensitivities have influenced master planning through an iterative process. Thus, the Proposed Development incorporates a degree of integral (or embedded) mitigation designed to avoid or reduce likely ecological effects.

EIA scoping opinion

12.8 An EIA Scoping Opinion was received from the Planning Inspectorate (PINS) in December 2020 which included comments in relation to the Ecology and Biodiversity Section of the Scoping Report. The comments are included in Table 12.1 below. Also contained within the table are how each comment has been addressed.

Table 12.1: Planning Inspectorate's comments from EIA Scoping Opinion in relation to Ecology (December 2020)

PINS ID	Ref.	Comments	Response
ID: 4.6.2	11.1	The Scoping Report lists a number of stakeholders that will be consulted on the scope of surveys and mitigation proposals. Hinckley and Bosworth Borough Council (HBBC) are missing from this list and should be consulted.	The Consultation referred to in section 11.1 is in regard to the survey scope and it would not normally be appropriate to consult outside the determining council on survey scope and mitigation. As the Ecology Officer for the region is part of the Leicestershire County Council (LCC) Ecology team they cover both areas and therefore the same ecologist will cover

PINS ID	Ref.	Comments	Response
			advice for a number of Councils.
ID: 4.6.3	Table 11.1, 11.16 & 11.22	In response to the Inspectorate's comments on the initial Scoping Report (April 2018), the Scoping Report (Table 11.1 (ID 2)) states that the study area is "to be assessed and implemented in the ES". The Scoping Report does not define the study area despite early survey work having been undertaken. Paragraph 11.22 of the Scoping Report states that the ES will review all potential impacts "within the DCO boundary and those associated with the off-site enabling works". Ecological impacts may arise at substantial distances from works. The ES should clearly explain how the study area has been defined and how it relates to the potential zone of influence of the Proposed Development. Where professional judgement has been relied on, an explanation should be provided of the factors and criteria relied on in reaching a decision.	The ecological Zone of Influence has been fully defined within this Preliminary Environmental Information Report (PEIR) and within the baseline report Technical Appendix 12.1. This will be reviewed and fully defined within the ES chapter. It is fully accepted that there will be impacts both direct and indirect, that may arise at substantial distances from the works. This is also addressed within the PEIR.
ID: 4.6.4	Table 11.1 11.20-11.22, 11.44	In response to the Inspectorate's comments on the initial Scoping Report (April 2018), the Scoping Report (Table 11.1 (ID 4)) states that the scope of the baseline surveys was agreed	A detailed baseline has been undertaken and has been refreshed and the scope has been agreed with the relevant bodies. The details of the survey scope and the

PINS ID	Ref.	Comments	Response
		with both the local authority and Natural England (NE), and that consultation will be ongoing in agreeing the scope of update surveys prior to submission. The ES should contain sufficient background information regarding the receiving environment, supported by relevant detailed surveys, to ensure all likely significant effects associated with the Proposed Development have been assessed. Changes made to the scope of baseline surveys made as a result of consultation should be documented in the ES.	consultation process to agree the scope for establishing a robust baseline have been provided within the PEIR.
ID: 4.6.5	Table 11.1, 11.22, 11.44	In response to the Inspectorate's comments on the initial Scoping Report (April 2018), the Scoping Report (Table 11.1 (ID 5)) states that potential environmental impacts and effects are to be assessed and implemented within the ES. A description of the impacts and effects that may be associated with the Proposed Development should be set out within the ES. Any likely significant effects from off-site enabling or highways works should also be identified as part of this assessment.	The anticipated impacts from the Proposed Development and any enabling or highways works have been assessed within the PEIR. Any impacts that are identified going forward will be further assessed within the ES chapter.

PINS ID	Ref.	Comments	Response
ID: 4.6.6	Table 11.1	In response to the Inspectorate's comments on the initial Scoping Report (April 2018), the Scoping Report (Table 11.1 (ID 6)) states that pre-mitigation effects which will take account of measures included in the draft Ecological Construction Method Statement (ECMS) and any 'embedded mitigation' is to be assessed and implemented within the ES. The ES should make it clear exactly which measures have been taken into account in reaching conclusions on the significance of effects from the Proposed Development.	This PEIR has set out the specific measures that it feels are 'embedded mitigation' and further mitigation and which has been taken into account when considering the significance of effects
ID: 4.6.7	Table 11.1	In response to the Inspectorate's comments on the initial Scoping Report (April 2018), the Scoping Report (Table 11.1 (ID 7)) states that the likely impacts from the Proposed Development during the construction and operational phases on nationally designated sites within the Zone of Influence of the Proposed Development are to be assessed and any mitigation implemented within the ES. There is little detail within the Scoping Report to explain the approach that will be taken. The ES must clearly identify	This PEIR has clearly identify the likely impacts that could arise from the development on all designated sites within the Zone of Influence of the Proposed Development. This is set out for both the construction phase and operational phase and sets out the mitigation that will be implemented to reduce or remove these impacts and what the overall residual impact will be.

PINS ID	Ref.	Comments	Response
		the likely impacts from the Proposed Development during the construction and operation phases, explaining any necessary mitigation and any residual impacts.	
ID: 4.6.8	11.19, 11.22 Table 11.2 Figures 11.1 and 11.2	The IEFs that are identified in the Scoping Report should be set out in detail in the ES. The ES should show how these IEFs and other key findings were identified, including the consultation carried out with consultees such as local authorities and NE. Figures 11.1 and 11.2 do not show the full extent of the red line boundary of the Proposed Development or the study area. The figures in the ES should clearly set out how identified IEFs and habitats relate to the chosen study area and relative distances from the red line boundary of the Proposed Development. All off-site works should be identified in the figures in relation to the identified IEFs and habitats.	The IEFs have clearly been set out within the baseline report Technical Appendix 12.1, for the Main Order Limits. The full IEFs to include all land within the DCO Site will be set out in detail within the ES and Baseline reports.
ID: 4.6.9 Ref: 11.26, 11.28		Indirect construction and operational impacts without mitigation measures and potential off-site effects from pollution/contamination, potential road traffic collisions with species and any other indirect or off-site effects should be cross referenced clearly to the relevant aspect	The potential for offsite impacts will be fully cross referenced with other chapters to ensure that there is consistency throughout.

PINS ID	Ref.	Comments	Response
		chapters in the ES and form part of the assessment.	
ID: 4.6.10	11.42	The mitigation strategy provisionally outlined in the Scoping Report should be set out in full in the ES, providing full details of the mitigation required to address any likely significant effects. Any monitoring required for the mitigation should also be set out in the ES. The ES should indicate how these measures will be secured through the DCO.	The mitigation strategy proposed has been set out within this PEIR. Further detail will be provided and set out within the ES chapter.
ID: 4.6.11	11.43	The Scoping Report states that the ongoing management, maintenance and monitoring of the IEFs and newly created habitats would be managed through the Landscape Ecological Management Plan (LEMP). The LEMP should be clearly set out and it should be clear how the LEMP provisions are to be secured through the DCO.	A framework LEMP will be produced to submit to the inspectorate as part of the main application, and it will detail how it will be secured.
ID: 4.6.12	n/a	Given the nature of the development and proximity to ancient woodlands, the Inspectorate considers the ES should assess the impacts of the inadvertent spread of pests and diseases to ecological receptors where significant effects are likely to occur. The consultation response from the Forestry	This aspect of the potential impacts has been incorporated into the PEIR and will be expanded within the ES chapter.

PINS ID	Ref.	Comments	Response
		Commission is highlighted in this regard.	

12.9 Comments in relation to the Ecology and Biodiversity Section of the EIA Scoping Report were also received from a range of other consultees and relevant stakeholders. These comments are included in Table 12.2 below together with details of how each comment has been addressed.

Table 12.2: Other Consultee Comments received in response to EIA Scoping in relation to Ecology (December 2020).

Consultee	Comments	Response
Burbage Parish Council	It is noted that the Scoping Report has recognised the importance of the Burbage Wood and Aston Firs Sites of Special Scientific Interest (SSSI). This area of woodland is immediately adjacent to the proposed development and the development could pose a severe threat to the wellbeing of this area. The ES should assess the full impact of the development upon the SSSI including knock-on ecological impacts of removing such a large area of farming land immediately adjacent to the woodland. The ES should consider the potential for pollution of the local water courses, particularly during construction activities.	The impacts on the SSSI has been considered within the PEIR below and will be fully assessed within the ES chapter.
Elmesthorpe Parish Council	The impact on the local environment, and Elmesthorpe Plantation, which is within the Parish	The impacts on the SSSI and adjoining woodlands has been considered within the PEIR below and will be fully assessed within

Consultee	Comments	Response
	and is part of Aston Firs.	the ES chapter.
Forestry Commission	Our main considerations were covered in our previous response dated 27th March 2018 concerning the impact on the adjacent ancient woodlands; Burbage Wood, Aston Firs, Freeholt Wood and Sheepy Wood.	The impacts on the adjacent Ancient Woodland has been considered within the PEIR below and will be fully assessed within the ES chapter.
	One area remains which was raised in our original submission that has not been addressed; this relates to the issue of Biosecurity. Whilst there isn't currently applicable legislation it is essential given the proximity of not just ancient woodlands but footpaths to this site, that the issue of biosecurity risks are taken seriously and assessed. An assessment may alter where elements of the proposed development are located.	The full impacts on the woodland have been considered within the PEIR below and will be fully assessed within the ES chapter including Biosecurity.
Hinckley and Bosworth Borough Council (HBBC)	11.1 references an EIA for the development site, will one of these be undertaken for Burbage Common and Woods, as the site is of National importance's in terms of their ecology, habitats and species, and also, with its location being directly adjacent to the development. Paragraph 11.1 notes that EDP will consult with a number of stakeholders on the scope of surveys and recommended mitigation. HBBC don't seem to be included in the list of consultees within this section and The Borough Council	This PEIR and EIA will be undertaken for the Proposed Development which will include its potential impacts on the Burbage Common and Woods. The Consultation referred to in section 12.1 is in regard to the survey scope and it would not normally be appropriate to consult outside the determining council on survey scope and mitigation, however in this instance the LCC Ecologist, Sue Timms, was consulted who covers consultations for the County and

Consultee	Comments	Response
	requests to be added to the list of consultees. More details are required on how wildlife corridors will be maintained throughout the development site to ensure links to Burbage Common and woods and the surrounding countryside. Burbage Common needs to be included within the EIA in order to establish baseline data, so to assess the short- and long-term environmental impact to this sensitive site.	therefore covers the various councils. Details on wildlife corridors will be provided within the ES chapter. The impacts on Burbage Common have been considered within the PEIR below and will be fully assessed within the ES chapter.
	Chapter 11 refers to completing a Phase 1 Habitat Study, including desk-based assessment. The Borough Council has recently prepared a Phase 1 study to inform the emerging Local Plan (May 2020). The study will provide valuable evidence regarding the quality of existing habitats within the borough and makes several recommendations for mitigation and habitat creation and enhancements, particularly at Burbage at Woods and Aston Firs SSSI and Burbage Common Local Wildlife Sites (LWS). The study informed the Green Infrastructure (GI) Strategy and both studies should be used to inform the ecological impact assessment and package of mitigation/enhancements which will contribute towards delivering and, where possible, maximise opportunities for biodiversity enhancement and net gain, referred to in paragraph 11.41 of the Scoping Report.	The Council's Phase 1 Survey and GI strategy has been reviewed. Information within the document will be referred to within the ES and the package of mitigation and enhancements will aim to be coherent and complimentary with these documents to ensure maximum opportunities for biodiversity.

Consultee	Comments	Response
Leicestershire County Council	A generic response regarding Ecology and Biodiversity and assessment methodology. No specifics made for this Site.	No further action required all relevant aspects of the generic advice have already been followed.
Natural England (NE)	Many generic recommendations again that have been undertaken. Nothing specific stated other than regards required in relation to the Burbage Common Woods and Aston Firs SSSI.	Similar response to that within the Discretionary Advice Service (DAS) consultation and recommendations have been followed through.
	Biodiversity net gain is a demonstrable gain in biodiversity assets as a result of a development project that may or may not cause biodiversity loss, but where the final output is an overall net gain. Net gain outcomes can be achieved both on and/or off the development site and should be embedded into the development process at the earliest stages.	The proposals have taken due regard to the provision of biodiversity net gain throughout, and it will be demonstrated through the use of appropriated matrices how net gain will be achieved.
Stoney Stanton Parish Council	83. Section 11.1 needs to include Hinckley and Bosworth District Council (HBDC) and Warwickshire County Council as the site borders each and the impact of the development will cover all areas. 84. Section 11.4 states the term “important” as per the Hedgerow Regulations but fails to state how “important” will be assessed. 85. Section 11.10 states the local policy that has been assessed but doesn’t include the Fosse Villages	83. The Consultation referred to in section 11.1 relates to the survey scope and it would not normally be appropriate to consult these two councils on survey scope and mitigation, however, in this instance the LCC Ecologist, Sue Timms, was consulted who covers consultations for the County and therefore covers various councils. It is not considered appropriate to involve Warwickshire Ecological Services as we are outside their jurisdiction.

Consultee	Comments	Response
	Local Plan where some of the development falls. 86. Table 11.2 has a section that refers to 'Badger' that appears redacted. In the interests of the document there should be no redacted sections. 87. Section 11.28 recognises the impact of the lighting pollution and other impacts on the site, but not on the ancient woodland or sites on the immediate border to the site that will be dwarfed by the development. 88. Figure 11.2 shows areas that either have existing wildlife sites or potential to become wildlife sites. There are sections of land that are shown where the landholder has not been contacted or involved in these proposals. There is no indication within the report that details what the scope and legal standing of these proposed LWSs would be.	84. The assessment of importance for the hedgerow regulations is set out within the regulations. 85. During the assessment process the Fosse Villages Local Plan will be looked at to ensure compliance, within areas that are affected. 86. The locations of sensitive information including those of badger setts, and signs will be redacted on Public Document as the information is sensitive and remains a concern for the welfare of the species due to badger baiting. If the un redacted information is truly required, then it can be requested. 87. The lighting impacts as well as noise and traffic are recognised on retained habitats and new habitats, which include those offsite habitats that are retained and therefore will be included within the assessment. 88. The proposed LWSs shown on Figure 11.2 (and which are now shown on Figure 12.2) are not proposed as part of the development. Instead, these are existing designations made by LCC. Therefore, the owners of these sites would not have been contacted by the applicant in this regard.

Guidance/Best practice

12.10 The identification and evaluation of IEFs for the purposes of EIA, and the assessment of significant adverse or beneficial effects on IEFs, will be undertaken with reference to the

Chartered Institute of Ecology and Environmental Management (CIEEM) 'Guidelines for Ecological Impact Assessment in the UK and Ireland', September 2018 (Version 1.1, updated September 2019).

12.11 In addition, the following guidance documents have been used to inform the assessment:

- Advice Note 7: Environmental Impact Assessment: Preliminary Environmental Information, Screening and Scoping (PINS, 2015a);
- Advice Note 9: Rochdale Envelope (PINS, 2012);
- Advice Note 10: Habitats Regulations Assessment relevant to nationally significant infrastructure projects (PINS, 2017a);
- Advice Note 12: Transboundary Impacts and Process (PINS, 2015b);
- Advice Note 17: Cumulative effects assessment relevant to nationally significant infrastructure projects (PINS, 2015c);
- Advice Note 18: The Water Framework Directive (PINS, 2017b); and
- The Design Manual for Roads and Bridges (DMRB) Volume 11: Environmental Assessment (and updates) (Highways Agency et al. 2008).

12.12 The following best practice guidance in relation to survey techniques and mitigation measures has been taken into account:

- British Standards Institute (2013) BS 42020 – Biodiversity – Code of Practice for Planning and Development;
- Joint Nature Conservation Committee, (2010). Handbook for Phase 1 habitat survey: A Technique for Environmental Audit;
- Marchant, J. H. (1983). Common Birds Census Instructions. BTO, Tring. 12pp.;
- Marchant, J. H., Hudson, R., Carter, S. P. & Whittington, P. A. (1990) Population Trends in British Breeding Birds. BTO, Tring;
- Gilbert, G., Gibbons, D. W. & Evans, J. (1998) Bird Monitoring Methods. RSPB, Sandy, Bedfordshire;
- English Nature, (2004). Bat Mitigation Guidelines;
- Collins, J. (ed.) (2016). Bat Surveys for Professional Ecologists: Good Practice Guidelines (3rd edn). The Bat Conservation Trust, London;
- Joint Nature Conservation Committee, (1999). Bat Workers Manual;
- Stone, E.L. (2013) Bats and lighting: Overview of current evidence and mitigation;

- Dean, M., Strachan, R., Gow, D. and Andrews, R. (2016). The Water Vole Mitigation Handbook (The Mammal Society Mitigation Guidelines Series). Eds Fiona Mathews and Paul Chanin. The Mammal Society, London;
- Harris, S., Cresswell, P., and Jeffries, D.J. (1989). Surveying Badgers, Mammal Society, London;
- Froglife. (1999). Reptile survey: an introduction to planning, conducting and interpreting surveys for snake and lizard conservation. Froglife Advice Sheet 10, Froglife, Halesworth;
- Gent, T., Gibson, S. (1999). Herpetofauna Workers Manual. JNCC;
- English Nature, 2004. Reptiles: Guidelines for Developers;
- National Rivers Authority (1992). River Corridor Surveys. Conservation Technical Handbook Number 1. NRA, Bristol; and
- Environment Agency (2003). River Habitat Survey in Britain and Ireland. Field Survey Guidance Manual: 2003. Bristol.

12.13 In relation to EIA and assessment of significant effects, CIEEM guidance (CIEEM, 2018) highlights that:

'A significant effect does not necessarily equate to an effect so severe that consent for the project should be refused planning permission. For example, many projects with significant negative ecological effects can be lawfully permitted following EIA procedures as long as the mitigation hierarchy has been applied effectively as part of the decision-making process.'

12.14 Guiding principles for delivering net biodiversity gain through developments is also provided in separate CIEEM guidance (2018).

Baseline data collection

12.15 The baseline ecological information collated for the Main Order Limits (including species scientific names) is set out in detail within Technical Appendix 12.1. The appendix details the full methodologies employed, their findings and any limitations. It seeks to identify the IEFs within the project's ecological Zone of Influence and defines the Zone of Influence for different receptors (Technical Appendix 12.1).

12.16 A summary of the baseline investigations undertaken across the Main Order Limits is provided below:

- Desk study (February 2016 and November 2021);
- Extended Phase 1 Habitat Survey (June 2017, June 2018 and July 2021);
- Hedgerow walkover survey (June 2017 and June 2021);
- Wintering bird surveys (January, February and March 2018 and December 2020, January 2021 and February 2021);
- Breeding bird surveys (April to June 2018 and April to June 2021);
- Tree and building inspections for bats (April and May 2018, May 2019 and May 2021;
- Bat building emergence and re-entry surveys (May to August 2018, May to September 2019 and May to August 2021);
- Bat activity surveys (April to September 2018, 2019 and 2021) including manual transects and static detector deployment;
- Otter and water vole surveys (May and August 2018 and July 2021);
- Badger surveys (July and November 2018 and September 2021);
- Great crested newt eDNA and aquatic surveys (April to June 2018) further eDNA surveys were undertaken in July 2019 and May 2021);
- Reptile surveys (May to September 2018 and April to October 2021); and
- Invertebrate surveys (Scoping survey May 2018 with detailed surveys in March 2019 and February 2021).

12.17 As detailed further in Technical Appendix 12.1, and referenced where appropriate, the scope of survey work was informed by the information derived from the initial surveys undertaken within the Main Order Limits, and in consultation with LCC and NE (as described further in Section 12.47 below). The reasoning behind certain surveys being 'scoped out' due to not being considered necessary or appropriate in this case, is also provided in Technical Appendix 12.1.

12.18 All surveys were undertaken with reference to best practice guidance where available. Any limitations in the survey work are detailed in Technical Appendix 12.1 and summarised below. Where relevant any such limitations have been factored into the assessment process.

12.19 Following the assessment and design process a number of junctions and rail and highway works are required away from the Main Order Limits. These areas of land will be subject

to further Phase 1 surveys and appropriate Phase 2 surveys where required. The potential impacts are thought to be minimal but will be fully assessed within the ES Chapter.

Consultation

12.20 The views of the Local Planning Authority (LPA) Ecologist (covered by the LCC Ecologists), NE and the Environment Agency (EA) were sought in respect of likely ecological sensitivities pertaining to the Main Order Limits during the formal screening/scoping stage as described above.

12.21 In addition, further consultation was undertaken with NE and LCC Ecologists in respect of likely ecological sensitivities pertaining to the Main Order Limits and wider Ecological Study Area and the necessary scope of surveys agreed.

12.22 A Discretionary Advice Service (DAS) request was made to NE in July 2018 to share provisional survey results and assessment of the value of on-site ecological receptors. NE's response was received on the 15 August 2018 (see Technical Appendix 12.3). This document has been shared with the LPA as part of the Scoping exercise. The habitats and species composition have not materially changed since the initial DAS request. Further consultation through the Scoping process has confirmed similar advice as to that provided within the DAS and therefore no further consultation has been undertaken.

12.23 The NE advice also recommends carrying out a Biodiversity Impact Assessment (BIA) calculation, using the DEFRA Metric, to allow for an objective assessment of biodiversity impacts and the degree of net gain or loss. This is now a standard part of an ecological assessment of proposed development.

Assessment methodology

Ecological Zone of Influence or Spatial Scope (Study Area)

12.24 The extent of the study area has been defined as the ecological zone of influence of the EIA Project. This has been determined through a review of the baseline ecological conditions relative to the Proposed Development in the context of the proposed activities. It has also been informed by liaison with consultees and other specialists involved in assessing the effects in other disciplines of the project, as considered within this PEIR and other supporting documentation.

12.25 The scope of the desk study reflects the sensitivity and value of potential ecological receptors while providing contextual information to assist with determining and evaluating the baseline. The following desk study search radii around the Main Order Limits were employed and are considered to be sufficient to cover the ecological zone of influence of the project:

- International statutory designations (15km radius);
- National statutory designations (5km);

- Non-statutory local sites (3km);
- Annex II bat species records (6km); and
- All other protected/notable species records (3km).

12.26 The field surveys undertaken to inform the assessment cover the Main Order Limits and, where access was permitted/available, the surrounding habitats to provide contextual information to further inform the assessment.

Ecology and biodiversity evaluation

12.27 An evaluation of IEFs has been made with reference to CIEEM's Ecological Impact Assessment Guidelines (CIEEM, 2018). A summary of the evaluation approach is provided below.

12.28 The guidelines advocate an approach to valuing features that involves professional judgement based on available guidance and information, together with advice from experts, who know the locality of the project and/or the distribution and status of the species or features that are being considered.

Designated Sites

12.29 Some sites have already been assigned a level of nature conservation value through designation, and the guidelines recommend that the reasons for this designation need to be taken into account in the assessment.

12.30 Where a feature has value at more than one designation level, its overriding value is that of the highest level.

Biodiversity

12.31 The guidelines state that there are various characteristics that can be used to identify ecological resources or features likely to be important in terms of biodiversity and that consultation, especially with local specialists, can be crucial for identifying less obvious important resources and features.

Habitats

12.32 The guidelines recommend that the value of areas of habitat and plant communities should be measured against published selection criteria where available. Where areas of a habitat or plant community do not meet the necessary criteria for designation at a specific level, the guidelines recommend that the ecologist may consider the local context if appropriate.

Species

12.33 The guidance deals with species that need to be assessed because they are of biodiversity value, rather than because they are legally protected (although some species may be legally protected as well as being of biodiversity value).

12.34 In assigning value to a species, it is necessary to consider its distribution and status, including a consideration of trends based on available historical records. The valuation of populations should make use of any relevant published evaluation criteria.

Geographical scope

12.35 The guidelines recommend that the value or potential value of an ecological resource or feature should be determined within a defined geographical context, and the guidelines provide a geographical range ('frame of reference') that can be adapted. The geographical frame of reference used in this assessment, based upon the CIEEM guidelines, is as follows:

- International value (Special Areas of Conservation (SACs), Special Protection Areas (SPAs), Ramsar sites);
- National value (SSSIs and National Nature Reserves (NNRs));
- County value (within Leicestershire: e.g. Local Nature Reserves (LNRs), LWSs, ancient woodlands, atypical and diverse species assemblages with good population sizes);
- District value (within the Blaby District or Borough of Hinckley and Bosworth) e.g. watercourses, ponds, hedgerows, woodland – where species rich/extensive/atypical examples are present – moderate population sizes or species assemblages with moderate to high diversity);
- Local value (within the local parish or similar: e.g. watercourses, ponds, hedgerows, woodland – common and widespread species with relatively moderate populations and relatively limited diversity);
- Site value (the Main Order Limits and immediate environs: small areas of common habitats such as grassland and scrub – common and widespread species with small populations and limited diversity); and
- Negligible value (typically applied to areas of open ground/built development/areas of hardstanding).

Assessment of likely impacts

12.36 The guidelines advocate an approach to assessing likely impacts that involves professional judgement based on available guidance and information.

12.37 The assessment of the likely impacts of the Proposed Development takes into account both on-site impacts and those that may occur to adjacent and more distant ecological features. Impacts can be permanent/temporary, direct or indirect, positive or negative and can include:

- Direct loss of wildlife habitats;
- Fragmentation and isolation of habitats;
- Disturbance to species from noise, light or other visual stimuli;
- Changes to key habitat features; and/or
- Changes to the local hydrology, water quality and/or air quality.

12.38 The significance of a negative effect (or a positive effect) is the product of the magnitude of the impact and the value or sensitivity of the nature conservation features affected. In order to characterise the impacts on each feature, the following parameters are taken into account:

- The magnitude of the impact;
- The spatial extent over which the impact would occur;
- The temporal duration of the impact;
- Whether the impact is reversible and over what timeframe; and
- The timing and frequency of the impact.

Criteria for Assessment

12.39 There is no agreed absolute method for assessing the significance of negative or positive impacts on nature conservation features. In addition, since the purpose of an EIA is to focus on likely significant effects, it is not reasonable to expect the assessment to include every ecological feature that may be affected, since effects are unlikely to be significant where features of low (Site level or below) value or sensitivity are, for example, subject to low or short-term impacts. On this basis, the assessment therefore focuses on ecological features that are considered by EDP, based on professional judgement, experience and contextual information, to be protected and/or of Local nature conservation value or above.

12.40 However, this does not mean that effects upon features of less than Local level nature conservation value have been discounted. Certain species and habitats that may not constitute IEFs based upon their nature conservation value, may still warrant consideration during the design of the development (and any mitigation identified) on the basis of their legal protection, their implications for policies and plans, or other issues, such as animal welfare. Indeed, the development still has a requirement to ensure no net

loss of biodiversity in accordance with the requirements of the National Planning Policy Framework (NPPF).

12.41 The guidelines also recommend that where ecosystem service provision (benefits people derive from the natural environment) might be affected as a result of a project's ecological effects, this should be recognised and the relevant data collected during the EIA to inform separate specialist assessments of social and economic value. This can enable the social and economic implications of ecological changes to be taken into account.

12.42 The integrity of 'designated' sites is described as follows and is taken from the Guidelines for EIA in the UK (CIEEM, 2018). It has been used in this assessment to determine whether the impacts of the Proposed Development on a designated site are likely to be significant:

'Significant effects encompass impacts on structure and function of defined sites and ecosystems. The following need to be determined: For designated sites - is the project and associated activities likely to undermine the site's conservation objectives, or positively or negatively affect the conservation status of species or habitats for which the site is designated, or may it have positive or negative effects on the condition of the site or its interest/qualifying features.'

12.43 The conservation status of habitats and species within a defined geographical area is described as follows (CIEEM, 2018), and has been used in this chapter to determine whether the impacts of the Proposed Development on non-designated habitats and species are likely to be significant:

'*Habitats - conservation status is determined by the sum of the influences acting on the habitat that may affect its extent, structure and functions as well as its distribution and its typical species within a given geographical area;*

Species - conservation status is determined by the sum of influences acting on the species concerned that may affect its abundance and distribution within a given geographical area.'

12.44 On the basis of the above, and within this assessment, ecological effects are described as either:

- Significant or not significant;
- Direct and/or indirect,
- Permanent or temporary; and
- Negative or positive.

12.45 Mitigation measures have been incorporated into the assessment parameter plans and taken into account during the assessment of effects, such that the residual impact assessment reflects the completed scheme. These measures include those required to achieve the minimum standard of established practice plus additional measures to further

reduce the effects of the scheme. The assessment takes into account the likely success of the mitigation.

12.46 The significance of the likely impacts upon IEFs has been assessed both before and after consideration of additional mitigation measures. The latter represents the assessment of the residual impacts of the Proposed Development.

12.47 In addition to determining the significance of an impact on any ecological features, this Chapter also identifies any legal requirements in relation to wildlife.

Temporal Scope

12.48 Likely impacts on ecological features have been assessed in the context of how the predicted baseline conditions within the ecological Zone of Influence might change between the surveys and the start of construction. It is anticipated a phased work programme for the Proposed Development will commence in 2026, with works being complete by 2038.

Cumulative Effects

12.49 Cumulative impacts that can be foreseen as a result of the Proposed Development in conjunction with these identified schemes, and any possible mitigation measures required, are considered at section 12.9.

Assumptions and limitations

12.50 The vast majority of surveys have been undertaken in suitable weather conditions at optimum times of year with reference to best practice guidance. Minor limitations specific to each of the field survey methodologies are detailed within the appropriate sections of Technical Appendix 12.1.

12.51 The initial environmental DNA (eDNA) surveys of on-site ponds for great crested newts returned positive results in four ponds. These ponds were then surveyed using traditional methods and were found to contain no breeding great crested newts (GCN). The ponds were then tested for eDNA again in order to confirm likely absence of GCN, but one pond returned a second positive result in 2019; however, survey in 2021 for all the ponds returned no positive eDNA. As a result of this, it is assumed that a potential small population of non-breeding GCN was present within the area, but has now declined to an undetectable population.

12.52 It should also be noted that owing to the seasonality of some species, as well as the ability for some species to quickly colonise sites, the absence of evidence of any particular species should not be taken as conclusive proof that the species is not present or that it will not be present in the future.

12.53 However, it is considered that the results of the Phase 1 survey and additional Phase 2 surveys undertaken in 2016, 2017, 2018, 2019 and 2021 are robust and reliable for the

identification of the habitats and the presence or absence of legally protected species and other IEFs within the Main Order Limits.

RELEVANT LAW, POLICY AND GUIDANCE

12.54 The Conservation of Habitats and Species Regulations 2017 (as amended) enacts, within the UK, EU Council Directive 92/43/EEC on the Conservation of Natural Habitats and Wild Fauna and Flora (as amended) and Directive 2009/147/EC on the Conservation of Wild Birds. Although these are European directives the legislation and legal protection offered to the habitats and species that it protects has been ratified into UK law. These Regulations provide for the designation and protection of statutory designated wildlife sites of European value ('European sites'), and the protection of a number of rare and vulnerable species in a European context ('European Protected Species' (EPS)). European Sites, including SPAs, SACs and Ramsar Sites are recommended for designation in the UK by the Joint Nature Conservation Committee (JNCC).

12.55 The Environment Act 2021 was passed into law in November 2021. Its overall aims are to strengthen environmental protection and deliver the UK Government's 25-year environment plan following the UK's exit from the European Union. Of greatest relevance to ecology and biodiversity are provisions within the Act for biodiversity gain to be a condition of planning permission in England. When these provisions come into force, following secondary legislation expected to be issued by the SoS within approximately two years of the Act passing into law, the delivery of a net gain in biodiversity of 10% (as measured by a standard biodiversity metric) will become a legal requirement of planning permission for development.

12.56 The Wildlife and Countryside Act 1981 (as amended, principally by the Countryside and Rights of Way Act 2000 and the Natural Environment and Rural Communities Act 2006) enshrines the protection of statutory designated wildlife sites of national importance (SSSIs) in England and Wales. The Act also sets out varying degrees of protection and offences with regard to native species and their habitats that are rare and vulnerable in a national context. The Act also provides for the control, management and offences in respect of invasive non-native species. Sites of national importance (SSSIs and NNRs) are designated by NE under the Act and are protected from any development that may destroy or negatively affect them, either directly or indirectly.

12.57 Section 40 of the Natural Environment and Rural Communities (NERC) Act 2006 places a statutory duty on LPAs to consider the effects upon biodiversity when exercising their functions in England and Wales. In addition, Section 41 of the Act makes for the provision of a list of habitats and species of principal importance for the conservation of biodiversity.

12.58 The Animal Welfare Act 2006 further protects wild animals from unnecessary suffering when under the control of man and combines with the Wild Mammals (Protection) Act 1996, which protects wild mammals from intentional cruelty.

12.59 The Protection of Badgers Act 1992 (as amended) affords protection specifically to badger and their setts.

12.60 Finally, 'important' hedgerows, for which there are specific ecological criteria, are protected from removal (up-rooting or otherwise destroying) by the Hedgerow Regulations 1997.

12.61 The following topic-specific policies are relevant to the assessment. These have been taken into account during the assessment since it is against these policies and legislative background that the proposed development will be judged to be acceptable on the grounds of biodiversity.

National planning policy

National Policy Statement for National Networks (2014)

12.62 The National Networks National Policy Statement (NPS) provides guidance on how decisions will be made relating to development consent orders for Nationally Significant Infrastructure Projects (NSIPs). The NPS recognises that some developments will have some adverse local impacts on noise, emissions, landscape/visual amenity, biodiversity, cultural heritage and water resources. The significance of these effects and the effectiveness of mitigation is uncertain at the strategic and non-locationally specific level of this NPS. Therefore, whilst applicants should deliver developments in accordance with government policy and in an environmentally sensitive way, including considering opportunities to deliver environmental benefits, some adverse local effects of development might remain.

12.63 Pages 51-55 of the National Networks NPS concerns biodiversity and ecological conservation. Paras. 5.25 to 5.26 of the NPS states:

'As a general principle, and subject to the specific policies below, development should avoid significant harm to biodiversity and geological conservation interests, including through mitigation and consideration of reasonable alternatives. The applicant may also wish to make use of biodiversity offsetting in devising compensation proposals to counteract any impacts on biodiversity which cannot be avoided or mitigated. Where significant harm cannot be avoided or mitigated, as a last resort, appropriate compensation measures should be sought.

In taking decisions, the Secretary of State should ensure that appropriate weight is attached to designated sites of international, national and local importance, protected species, habitats and other species of principal importance for the conservation of biodiversity, and to biodiversity and geological interests within the wider environment.'

National Planning Policy Framework (2021)

12.64 At the heart of the NPPF is a presumption in favour of sustainable development, this being the golden thread running throughout the document.

12.65 Chapter 15 of the NPPF 'Conserving and enhancing the natural environment' sets out the requirement to consider biodiversity in planning decisions.

12.66 The paragraphs within Chapter 15 relevant to the Scheme are summarised below:

'174 Planning policies and decisions should contribute to and enhance the natural and local environment by:

a. protecting and enhancing valued landscapes, sites of biodiversity or geological value and soils (in a manner commensurate with their statutory status or identified quality in the development plan);

b. recognising the intrinsic character and beauty of the countryside, and the wider benefits from natural capital and ecosystem services – including the economic and other benefits of the best and most versatile agricultural land, and of trees and woodland;

c. maintaining the character of the undeveloped coast, while improving public access to it where appropriate;

d. minimising impacts on and providing net gains for biodiversity, including by establishing coherent ecological networks that are more resilient to current and future pressures;

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

f. remediating and mitigating despoiled, degraded, derelict, contaminated and unstable land, where appropriate.

179 To protect and enhance biodiversity and geodiversity, plans should:

a. Identify, map and safeguard components of local wildlife-rich habitats and wider ecological networks, including the hierarchy of international, national and locally designated sites of importance for biodiversity61; wildlife corridors and stepping stones that connect them; and areas identified by national and local partnerships for habitat management, enhancement, restoration or creation62; and

b. promote the conservation, restoration and enhancement of priority habitats, ecological networks and the protection and recovery of priority species; and identify and pursue opportunities for securing measurable net gains for biodiversity.

180 When determining planning applications, local planning authorities should apply the following principles:

a. if significant harm to biodiversity resulting from a development cannot be avoided (through locating on an alternative site with less harmful impacts), adequately mitigated, or, as a last resort, compensated for, then planning permission should be refused;

b. development on land within or outside a Site of Special Scientific Interest, and which is likely to have an adverse effect on it (either individually or in combination with other developments), should not normally be permitted. The only exception is where the benefits of the development in the location proposed clearly outweigh both its likely impact on the features of the site that make it of special scientific interest, and any broader impacts on the national network of Sites of Special Scientific Interest;

c. development resulting in the loss or deterioration of irreplaceable habitats (such as ancient woodland and ancient or veteran trees) should be refused, unless there are wholly exceptional reasons and a suitable compensation strategy exists; and

d. development whose primary objective is to conserve or enhance biodiversity should be supported; while opportunities to improve biodiversity in and around developments should be integrated as part of their design, especially where this can secure measurable net gains for biodiversity or enhance public access to nature where this is appropriate.'

12.67 In addition to the requirements of the NPPF, NE, as the statutory nature conservation organisation for England, provides specific 'Standing Advice' regarding various protected species as 'material considerations' (NE 2016)1. This advice contains details on likely significant impacts and recommended survey effort to support planning applications.

Local planning policy

12.68 The DCO Order Limits fall across four LPA areas, namely: Blaby District, and Hinckley and Bosworth Borough, Harborough District and Rugby Borough Councils. The relevant adopted local statutory planning documents include:

- Blaby District Local Plan (Core Strategy) (adopted 2013);
- Blaby District Local Plan (Delivery) Development Plan Document (adopted 2019);
- Hinckley and Bosworth Borough Core Strategy (adopted 2009);
- Hinckley and Bosworth Borough Site Allocations and Development Management Policies (adopted 2016);

[1] Available at: https://www.gov.uk/guidance/protected-species-how-to-review-planning-applications

- Harborough Local Plan (adopted 2019); and
- Rugby Borough Council Local Plan (adopted 2019).

12.69 A review of the local planning policy, including relevant supplementary planning documents, evidence base documents and associated guidelines relevant to this assessment, is contained below.

Blaby District Core Strategy (adopted February 2013)

12.70 Policies of relevance to ecology and biodiversity contained within the Blaby District Local Plan Core Strategy Development Plan Document (DPD) (Adopted 2013) consist of the following:

- Policy CS19 – Bio-diversity and geo-diversity, which aims to protect the districts natural environment and increase its biodiversity through appropriate design of forthcoming proposals.

Blaby District Local Plan (Delivery) Development Plan Document (adopted 2019)

12.71 The Blaby District Local Plan (Delivery) Development Plan Document contains the development management policies that apply across the District, there are no specific Development Management (DM) policies that relate solely to ecology or biodiversity, however, see the following of relevance to ecology:

'DM2 Development in the Countryside

…..

(*vi) To protect the important areas of the District's natural environment (species and habitats), landscape and geology and to improve bio-diversity, wildlife habitats and corridors through the design of new developments and the management of existing areas by working with partners.'*

12.72 The HBBC administrative area bounds the western most extent of the Main Order Limits and makes up a proportion of the proposals potential zone of influence (where potential impacts may occur).

12.73 The statutory development plan for HBBC comprises 'The Local Plan 2006 – 2026' which is made up of a series of documents. Those of relevance include:

- Core Strategy (adopted 2009); and
- Site Allocations and Development Management Policies (adopted 2016).

12.74 A review of the local planning policy circumstances, including relevant supplementary planning documents, evidence base documents and associated guidelines relevant to this

assessment, is contained below. A detailed review of planning policy will be undertaken within the Planning Statement accompanying the DCO application.

Hinckley and Bosworth Core Strategy (adopted 2009)

12.75 Spatial Objective 10 of the HBBC Core Strategy DPD is of relevance to Ecology and Biodiversity:

'***Spatial Objective 10: Natural Environment and Cultural Assets*** *To deliver a linked network of green infrastructure, enhancing and protecting the borough's distinctive landscapes, woodlands, geology, archaeological heritage and biodiversity and encourage its understanding, appreciation, maintenance and development.'*

12.76 Core Policy 20 'Green Infrastructure' also contains a section that is relevant to the proposals:

*'….. **Burbage Common and Woods** - Increase the size of the site to increase both the community value and biodiversity holding capacity and improve access to the site, particularly for pedestrians and cyclists.'*

Hinckley and Bosworth Site Allocations and Development Management Policies (adopted 2016)

12.77 Policies within the Site Allocations and Development Management Policies DPD of relevance include the following:

- Policy DM6 – Enhancement of Biodiversity and Geological Interest; and
- Policy DM9 – Safeguarding Natural and Semi-Natural Open Spaces.

Harborough Local Plan (adopted 2019);

12.78 Relevant policies within the Harborough Local Plan include the following:

- Policy GI1 - Green infrastructure networks; and
- Policy GI5 - Biodiversity and geodiversity

Rugby Borough Council Local Plan (adopted 2019)

12.79 Relevant policies within the Rugby Borough Council Local Plan include the following:

- Policy NE1: Protecting Designated Biodiversity and Geodiversity Assets;
- Policy NE2: Strategic Green and Blue Infrastructure;
- Policy NE3: Landscape Protection and Enhancement; and
- Policy SDC2: Landscaping.

Neighbourhood plans

Fosse Villages Neighbourhood Plan (adopted 2021)

12.80 The southern and eastern extents of the DCO boundary fall within the Fosse Villages Neighbourhood Plan area. The Neighbourhood Plan identifies the presence of three ecologically important SSSIs within the Plan area, all of which are within 5km of the Main Order Limits, namely: Burbage Wood and Aston Firs; Croft Hill and Croft Pasture SSSI. Potential effects on these SSSIs are considered in the assessment.

12.81 The relevant policy within the Neighbourhood Plan is Policy FV4: Biodiversity, which states:

'New development which minimises impacts on and provides net gains for biodiversity and enhances resilience to current ecological pressures on habitats at Fosse Meadows Nature Park will be supported.

New development will be expected to maintain and enhance existing ecological corridors and landscape features (such as watercourses, hedgerows and tree-lines) to support biodiversity.'

BASELINE CONDITIONS

12.82 A general description of the Main Order Limits and surroundings is provided in Chapter 2: *Site description* of this PEIR.

12.83 This section summarises the baseline ecological conditions determined through the course of desk-based and field-based investigations described above. In particular, this section identifies and evaluates those ecological features/receptors that lie within the potential Zone of Influence of the Main Order Limits and which form the focus of the Principal Development, as well as the Associated Development, comprising the off-site highways and junction works.

12.84 Full results of the surveys undertaken are provided within Technical Appendix 12.1, and on Figures 12.1 to 12.23.

Description of study area

12.85 The Main Order Limits is centred approximately at Ordnance Survey Grid Reference (OSGR) SP 46314 94858 and is located on the eastern edge of Hinckley. The Main Order Limits encompass mainly agricultural fields of both pasture and arable cultivation, which are bounded to the north-west by the Leicester to Hinckley railway and the link road to the A47 section to the north of Burbage Common Road to the B4668, with the M69 motorway defining the south-eastern boundary. The south-western boundary of the Main Order Limits are defined by field boundaries, beyond which are blocks of deciduous woodland, including Burbage Wood and Aston Firs SSSI and Freeholt Wood potential Local

Wildlife Sites (pLWS). The north-eastern boundary is also bounded by field boundaries beyond which lies the village of Elmesthorpe, a linear settlement on the B581 (Station Road). An unnamed stream flows north-eastward through the southern portion of the Main Order Limits. A number of LWSs and pLWSs exist within and directly adjacent to the Main Order Limits.

Designated sites

Statutory Designations

12.86 No part of the Main Order Limits are covered by any internationally-important statutory designations and there are no such designations within a 10km radius.

12.87 The Main Order Limits is not covered by any nationally- or locally-important statutory designations. There are five such designations within 5km of the Main Order Limits, namely four designated as SSSIs and a single LNR (which overlaps and forms part of a SSSI). Burbage Wood and Aston Firs SSSI and the overlapping Burbage Common and Woods LNR are located immediately adjacent to the Main Order Limits. The SSSI and LNR have therefore been scoped into the EIA as an IEF of National value.

12.88 As detailed further in Technical Appendix 12.1, the other statutory designated sites within 5km are not considered to be at risk of significant direct adverse impacts as a result of the Proposed Development.

12.89 The Air Quality chapter (Chapter 9) has looked at a number of statutory designated sites that are located at a greater distance from the Proposed Development given that these effects may result from increased traffic volumes. There are possible indirect adverse impacts on statutory designated sites in the form of habitat degradation as a result of nutrient deposition. The results of the air quality study (Chapter 9) show that although some of the SSSI's will have deposition greater than the critical load during the operational phase, the impacts from the Proposed Development do not give rise to significant rises in deposition (greater than 1% of current load levels experienced) and can therefore be ruled out as a significant impact.

12.90 Therefore, due to their reasons for designation, degree of spatial separation and lack of ecological connectivity between them and the Main Order Limits, and/or level of current recreational use or nutrient deposition, these sites have been scoped out of the EIA as IEFs and are not considered further in this assessment.

Non-statutory Designations

12.91 Within 3km of the central grid reference of the Main Order Limits are 13 LWS (see Figure 12.2), of which two lie within the Main Order Limits (Field Rose Hedgerow and Elmesthorpe Plantation Hedgerow, one lies immediately adjacent to the western boundary of the Main Order Limits (Burbage Common and Woods, which is also part of the LNR and SSSI), and one lies immediately adjacent to the southern boundary (The Borrow Pit Grassland). Additionally, two LWSs (Billington Rough and Hay Meadow) lie

100m and 250m to the north of the railway respectively.

12.92 Also, within 3km of the Main Order Limits are 13 cLWS, and 60 pLWS, of which seven are within the Main Order Limits (Freeholt Meadow, Woodland adj. to Aston Firs, Burbage Common Road Hedgerows, Burbage Common Road Railway Bridge, Junction 2 Grassland, B4669 Road Verge and Elmsthorpe Boundary Hedgerows). Burbage Wood and Aston Firs SSSI and Freeholt Wood pLWS are also listed as Ancient Semi-Natural Woodland (ASNW).

12.93 Of these designations, an assessment has been made of those designations likely to be affected by the Proposed Development. All LWS and pLWSs within and directly adjacent to the Site and the A47 Link corridor are sufficiently near or connected via receptor pathways to require consideration in relation to the Proposed Development (see Figure 12.2). Grassland sites within 250m of the Main Order Limits have also been considered. These non-statutory designations are described further in Table 12.3.

Table 12.3: Relevant Non-statutory Designations.

Site Name (and Reference)	Designation	Distance from Main Order Limits	Reasons for Designation
Burbage Common and Woods	LWS	Immediately adjacent to western boundary	Transitional mesotrophic/acid grassland, ASNW, significant bird and amphibian assemblages and Red Data Book species, with scrub and ponds. Community value.
Field Rose Hedgerow	LWS	Within	Species-rich hedgerow
Elmesthorpe Plantation Hedgerow	LWS	Within	Species-rich hedgerow
The Borrow Pit	LWS	Immediately adjacent to southern boundary	Mesotrophic grassland

Site Name (and Reference)	Designation	Distance from Main Order Limits	Reasons for Designation
Billington Rough	LWS	Immediately adjacent to north eastern boundary	Wet grassland with pond
Hay Meadow	LWS	250m to north of railway in north-east	Mesotrophic grassland
Freeholt Woods	pLWS	Immediately adjacent to southern boundary	Broad-leaved woodland
Freeholt Meadow	pLWS	Within	Mesotrophic grassland
Woodland Adjacent to Aston Firs	pLWS	Within	Broad-leaved woodland
Castlewood Grassland	pLWS	Immediately adjacent to south-western boundary	Mesotrophic grassland
Stanton Road Verge 2	pLWS	Immediately adjacent in north-east	Mesotrophic grassland
Home Farm Grassland	pLWS	Immediately adjacent in north-east	Mesotrophic grassland

Site Name (and Reference)	Designation	Distance from Main Order Limits	Reasons for Designation
Trackside Meadow	cLWS	Immediately north of railway in north-east	Mesotrophic grassland
Burbage Common Road Hedgerows	pLWS	Within	Species-rich hedgerow with trees
Burbage Common Road Railway Bridge	pLWS	Within	Brick railway bridge with ferns
Junction 2 Grassland	pLWS	Within	Mesotrophic grassland
B4669 Road Verge	pLWS	Within	Mesotrophic grassland
Elmesthorpe Boundary Hedgerows	pLWS	Within	Species-rich hedgerow

12.94 The remainder of the non-statutory designations within 3km of the Main Order Limits, which are not listed in Table 12.3, are not considered to be at risk of significant adverse impacts as a result of the Proposed Development. This is due to their degree of separation and lack of connectivity with the Main Order Limits coupled with their reasons for designation, as described further in Technical Appendix 12.1. They have therefore been scoped out of the EIA as IEFs.

Habitats

12.95 A full description of the habitats present within the Main Order Limits is provided in Annex 1 of Technical Appendix 12.1, and the distribution of these habitats is shown on Figure 12.3. In summary, the main habitats found and described within the Main Order Limits (and their approximate extents) are as follows:

- arable land (134.12 ha);
- improved and amenity grassland (40.4 ha);
- species-poor semi-improved grassland (21.4 ha);
- buildings/hardstanding/bare ground (7.77 ha);
- broadleaved plantation woodland (0.75);
- scrub and tall ruderal (6.17ha);
- broadleaved semi-natural woodland (1.27 ha);
- semi-improved neutral grassland (1.16 ha);
- waterbodies (0.21 ha);
- marshy grassland (0.33 ha);
- dry ditches (1,232m);
- wet ditches and stream (1,991m);
- species-rich hedgerows (13,270m); and
- species-poor hedgerows (5,610m).

12.96 The Main Order Limits principally comprise arable, improved, semi-improved grassland, buildings and hardstanding, marshy grassland and tall ruderal vegetation of negligible and Site level ecological importance only, owing to their limited distinctiveness, structural and botanical diversity, and intensive management.

12.97 The semi-improved neutral grassland, pond network, plantation woodland and ditches are considered to be IEFs of Local nature conservation value, owing to their positioning, relative lack of species-diversity and extent.

12.98 The hedgerow/tree line network demarcating the field boundaries, the scattered mature trees across the Main Order Limits, and the parcels of broadleaved semi-natural woodland are considered to be IEFs of District nature conservation value owing again to their positioning, species-diversity and extent. Despite its shading and lack of aquatic vegetation, the stream is also considered to be of District nature conservation value, due to its connectivity with the wider landscape, including Aston Firs in the west.

12.99 The valued habitats noted above, together with other habitats of little or negligible intrinsic value, have also been found in some instances to support protected or notable species. This is discussed further within the relevant species sub-sections of this chapter below.

Species

12.100 As set out previously, information on protected and/or notable species within or near to the Main Order Limits and Ecological Study Area was collected through a desk study and a range of field surveys. The findings of these investigations are set out in full in Technical Appendix 12.1, and briefly summarised below.

Birds

12.101 The winter bird survey recorded a number of species of conservation concern utilising the Main Order Limits, including some small, loose flocks of skylark (*Alauda arvensis*), groups of redwing (*Turdus iliacus*) and fieldfare (*Turdus pilaris*), and small groups of meadow pipit (*Anthus pratensis*), linnet (*Linaria cannabina*) and yellowhammer (*Emberiza citrinella*).

12.102 Species of birds recorded during the breeding bird surveys across the Main Order Limits were predominantly resident passerines, including a number of 'farmland indicator' species (as identified by the RSPB) and a proportion of summer migrants. A number of species of conservation concern were recorded as breeding or possibly breeding within the Main Order Limits, notably skylark, which were confirmed breeding in reasonable numbers. Furthermore, barn owl (*Tyto alba*) a Schedule 1 species, were considered to be possibly breeding within the Main Order Limits.

12.103 Overall, the diversity and density of wintering and breeding birds recorded within the Main Order Limits is considered to be mostly typical for a lowland urban edge farmland site in central England. Diversity and abundance are slightly higher than is generally found, although given the size of the Main Order Limits, this is not surprising. Farmland indicators were recorded in moderate numbers, including yellowhammer, linnet, grey partridge (*Perdix perdix*), lapwing (*Vanellus vanellus*) and yellow wagtail (*Motacilla flava*). The bird assemblage supported by the Main Order Limits is therefore considered to be of importance at the District level.

Bats

12.104 The Main Order Limits contains 33 buildings/built structures (see Figure 12.12), all of which were assessed for their potential to support roosting bats. Five of these buildings (B2, B3a, B12, B20 and B21) were found to support bat roosts in 2021. B12, B20 and B21 were found to support only single common pipistrelle bats in 2021 and no roosts had been recorded in these buildings previously. B2 was found to support a roost of two common pipistrelle bats in 2021 and supported three bats of this species during the previous surveys. Building B3a was found to support eight common pipistrelle bats in 2021 and in previous surveys was found to support three common pipistrelle and six long-eared bats.

12.105 A total of 83 trees were found to have bat roost potential (8 with high, 22 with moderate and 53 with low potential) within the Main Order Limits (see Figure 12.13). No trees were confirmed as roosts during the ground level visual assessment or subsequent general activity surveys..

12.106 The activity surveys across the Main Order Limits recorded low to moderate levels of commuting and foraging bat activity, mainly associated with the species-rich hedgerows, woodland edge, waterbodies and mature trees. This activity was fairly evenly spread across the Main Order Limits, and species diversity is fairly low, being dominated by common pipistrelles (86.3% of all static detector recordings made) with at least eight other species recorded (*Myotis* sp. not identified to species level) during the transect and automated detector surveys, including a few passes from two rarer species locally and nationally - Nathusius' pipistrelle (six recordings spread between April to September) and barbastelle (two recordings).

12.107 The bat assemblage recorded within the Main Order Limits is typical of an urban edge farmland site in central England, with common and widespread generalist species accounting for the vast majority of foraging and commuting activity, and a small amount of activity from several rarer species, as shown on Figures 12.14 – 12.20. Based on the bat activity findings summarised above, the confirmed and potential roosting in buildings, and the potential roosting in trees within/near to the Main Order Limits, the bat assemblage present is considered to be of importance at the Local level.

Otter

12.108 A single record for otter (*Lutra lutra*) from 2002 from 400m to the north-east of the Main Order Limits, nearby to the stream which runs through the Main Order Limits was returned from Leicestershire and Rutland Environmental Records Centre (LRERC) during the desk study. During the two detailed walkover surveys in 2018, an old otter spraint was found immediately adjacent to the Main Order Limits, along the wet ditch on the north-western corner of the Main Order Limits. The update surveys in 2021 found no evidence of the species

12.109 The evidence found is not considered to be indicative of a permanent population on-site and is more likely to indicate the overspill of populations from the adjacent Burbage Common and Woods LNR. The population is therefore judged to be of importance at the Site level only.

Badger

12.110 A reasonably large number of recent records of badger (*Meles meles*) were returned by the desk study. The majority of these were for setts along the railway line which bounds the Main Order Limits to the North and the M69 embankment, which bounds the Main Order Limits to the south-east.

12.111 During the detailed walkover surveys in 2018, 2019 and 2021, a number of badger setts were discovered across the Main Order Limits and immediate surroundings, comprising one main sett just off-site to the west, one subsidiary sett, and an outlier sett within the Main Order Limits. Evidence of foraging and dispersal across the Main Order Limits was also found.

12.112 The survey confirms the presence of badgers and active setts within the Main Order Limits; and suggests that the Main Order Limits forms a core part of the territory of at least one badger clan. As badgers are relatively common and widespread nationally and within Leicestershire, the presence of the setts on a site of this size is not unexpected. The badger population present is consistent with populations across the midlands and is therefore considered to be of Site value. The badger population is considered to be an IEF owing to their legally protected status.

Water Vole

12.113 Seven records of water vole (*Arvicola amphibius*) were returned, dated between 1998 and 2003, from around the Burbage Common area.

12.114 During the two detailed surveys for water vole in 2018, no water voles or confirmed evidence of this species was found, apart from a single instance of possible feeding remains, found on the wet ditch on the north-western edge of the Main Order Limits. The 2021 surveys found no evidence of use by the species. Therefore, water voles are not considered to be an IEF and are not discussed further within this assessment.

Brown Hare

12.115 No records of hare were returned in the desk study by LRERC. However, they were recorded commonly across arable land within the Site, including a juvenile on one occasion. This species has therefore been valued as important at a Local level.

Great Crested Newt and Other Amphibians

12.116 Great crested newt (*Triturus cristatus*), common frog (*Rana temporaria*), smooth newt (*Lissotriton vulgaris*) and common toad (*Bufo bufo*) records from as recently as 2012 were all returned as part of the desk study. The majority of GCN records were from Hinckley Golf Course to the north-west, Sapcote to the south-east and around the Earl Shilton bypass, which is situated to the north-east of the Main Order Limits.

12.117 In 2018, the eDNA survey returned a positive result for the presence of great crested newt eDNA in ponds P2, P7 and P62 (onsite) and P35 (off-site) but was negative for all other surveyed ponds within the Main Order Limits. Access was not granted to the majority of off-site ponds. No great crested newts (or eggs or larvae) were recorded during the course of the six conventional pond surveys undertaken of P2, P7, P35 and P62 in 2018. A second eDNA test was carried out on these four ponds following this result, resulting in a positive result for just one pond, P2. In 2019, only P63 (off-site) returned a positive eDNA result and in 2021 all sampled ponds tested negative.

12.118 As a result of this, it is assumed that a potential small population of non-breeding GCN was present within the area, but has now declined to an undetectable population. It is recommended that further surveys would always be required to establish if the population has recovered but otherwise it is not considered that the GCN are an IEF for this Site.

12.119 Other amphibian species recorded during the 2018 surveys include toads (*Bufo bufo*), frogs (*Rana temporaria*) and smooth newts (*Lissotriton vulgaris*). Toads are listed as a Species of Principal Importance under Section 41 of the NERC Act (2006) in England, and due to the numbers recorded, they have been valued at a Local level.

12.120 Common frog and smooth newts were recorded at relatively low densities, consequently being valued at a Site level, and are therefore not considered to warrant inclusion as IEFs in their own right. It is considered that the assessment and mitigation of the pond habitats in relation to toads will act as a surrogate for safeguarding the interests of these species more generally.

Reptiles

12.121 The desk study returned records of grass snake (*Natrix helvetica*) on the edge of Burbage and in arable field margins to the north of the Main Order Limits. A record of adder (*Vipera berus*) was also returned from Hinckley Golf Club in 2005.

12.122 A 'low' population of grass snake (with a peak count of 4 adults) and slow worm (*Anguis fragilis*) (with a single individual recorded) was found during the refugia-based reptile survey undertaken across the Main Order Limits during 2018, 2019 and 2021 seasons. Due to the common and widespread distribution of this species and relatively small numbers recorded, the grass snake population has been valued at a Site level and is therefore not considered to warrant inclusion as an IEF in its own right. Although not considered an IEF, further consideration has been given to sensitive working methodologies during the construction phase accordingly.

Invertebrates

12.123 Several records of notable moths and butterflies were returned by LRERC from the search radius.

12.124 The majority of the Main Order Limits is not considered to support important populations of invertebrates, given the dominance of arable and improved/semi-improved grassland habitats. However, habitats including the hedgerow network, scattered mature trees, woodland, waterbodies and watercourse provide opportunities for terrestrial and aquatic invertebrates, at a Site level. Invertebrates are therefore not considered to warrant inclusion as an IEF in their own right and the assessment of effects and mitigation relating to these habitats will act as a surrogate to safeguard such interests.

Summary of important ecological features

12.125 Based on the baseline ecological information described above (and presented in full in Technical Appendix 12.1), a number of IEFs have been identified and are summarised in Table 12.4. Informed by the baseline investigations and consultations described above, the IEFs taken forward for detailed assessment comprise those assessed to be of Local level nature conservation value or above.

Table 12.4: Summary of Important Ecological Features (IEFs)

Important Ecological Feature	Key Attributes	Nature Conservation Importance
Statutory Designated Sites		
Burbage Woods and Aston Firs SSSI	Ash-Oak-Maple woodland adjacent to the west of the Main Order Limits.	National
Burbage Common and Woods LNR	Semi-natural woodland and mesotrophic grassland, overlapping with the SSSI.	County/National
Non-statutory Designated Sites		
Burbage Common and Woods LWS	Semi-natural woodland and mesotrophic grassland, overlapping with the SSSI.	County/National
Field Rose Hedgerow LWS	Species-rich hedgerow with 15 woody species.	County
Elmesthorpe Plantation Hedgerow LWS	Species-rich hedgerow with 8 species.	County
The Borrow Pit LWS	Mesotrophic grassland.	County
Billington Rough LWS	Wet grassland with pond.	County
Hay Meadow LWS	Mesotrophic grassland.	County

Important Ecological Feature	Key Attributes	Nature Conservation Importance
Freeholt Meadow pLWS	Species-poor, semi-improved grassland.	Local
Woodland adj. to Aston Firs pLWS	On-site broad-leaved woodland with moderate structural and botanical diversity.	District
Castlewood Grassland pLWS	Mesotrophic grassland (not surveyed).	District
Burbage Common Road Hedgerows pLWS	Species-rich hedgerow with 7 woody species.	District
Burbage Common Road Railway Bridge pLWS	Railway bridge with ferns. Potential for roosting bats (no roosts confirmed through survey).	District
Junction 2 Grassland pLWS	Semi-improved neutral grassland surrounded by woodland.	District
B4669 Road Verge pLWS	Mesotrophic grassland (not surveyed).	District
Elmesthorpe Boundary Hedgerows pLWS	Species-rich hedgerow with 9 woody species.	District
Stanton Road Verge 2 pLWS	Mesotrophic grassland.	District
Home Farm Grassland pLWS	Mesotrophic grassland.	District

Important Ecological Feature	**Key Attributes**	**Nature Conservation Importance**
Trackside Meadow cLWS	Mesotrophic grassland.	District
Habitats		
Semi-improved Neutral Grassland	Grassland with poor to moderate species-diversity, value limited by extent and isolation.	Local
Hedgerow and Tree Network (not including pLWS or LWS)	Network of predominantly species-rich hedgerows and mature tress associated with the field boundaries that form Local dispersal corridors for wildlife.	District
Woodland (not including Woodland adj. to Aston Firs pLWS)	Small areas of plantation and semi-natural broadleaved woodland.	Local
Ponds	Network of permanent water bodies supporting a few aquatic species and forming part of the local ecological network.	Local
Stream	Stream supporting very few aquatic species but forming a wildlife corridor through landscape.	District
Ditches	Mostly dry, but a small number of wet ditches present supporting aquatic flora.	Local
Fauna		

Important Ecological Feature	Key Attributes	Nature Conservation Importance
Winter Birds	Assemblage including reasonable flocks of farmland specialists, with a range of other species of conservation concern in smaller numbers. Value limited by management regime and levels of disturbance.	Local to District
Breeding Birds	Breeding assemblage including reasonable numbers of farmland specialists, including a population of up to 42 pairs of skylark and other ground nesting species.	District
Bats	Common and widespread assemblage of foraging/commuting/roosting bats primarily associated with higher value boundary hedgerow and tree habitats.	Local
Badger	An active subsidiary sett within hedgerow in west of site, main sett just off-site to the west, outlier sett towards south-east of site. band in the south-west of the Main Order Limits. The habitats present on-site provide opportunities for foraging and commuting badgers.	Site
Otter	One old spraint on wet ditch in north-western corner of Site in 2018 not recorded again since.	Site
European hare	Hare present over most arable land within the Main Order Limits.	Local
Reptiles	Records of grass snake in local area, low population of grass snake and slow worm recorded on-site.	Site

Important Ecological Feature	Key Attributes	Nature Conservation Importance
Common toad	Records of amphibians present nearby, including common toad. Medium population recorded during reptile and GCN surveys.	Local

12.126 In accordance with the assessment methodology described earlier, all other habitats and species/species groups are deemed to be of only Site level nature conservation importance or less, and will not be taken forward for detailed assessment, since effects upon such features are unlikely to be 'significant' in EIA terms. The only exception is badger, whereby although the population present is regarded as only important at the Site level, this species is regarded as an IEF by virtue of its legal protection (individuals and their setts are protected at all times).

Future baseline

12.127 It is anticipated that in the absence of development, the Main Order Limits would continue to be managed as arable and pastoral farmland. Depending on the farming regime, the quality of habitats and opportunities for different species may vary slightly over time, particularly farmland birds. Such variations are unlikely to be significant and would be considered as standard fluctuations in a dynamic farming environment. It is near-certain that the existing baseline described above would therefore not appreciably change.

POTENTIAL SIGNIFICANT ENVIRONMENTAL EFFECTS OF THE PROPOSALS

12.128 The key inherent mitigation measures included within the parameter plans (see PEIR Chapter 2) pertinent to the ecological impact assessment include:

- substantial buffer of a minimum of 25m, but with a majority exceeding 50m, between built development and Burbage Wood and Aston Firs SSSI and Freeholt Wood pLWS/ASNW off-site woodland;
- retention of on-site broadleaved semi-natural woodland from the proposed hard development, including Woodland adj. to Aston Firs pLWS;
- retention and provision of buffers to hedgerows around the western, southern and eastern boundaries of the Main Order Limits, including Field Rose Hedgerow and Elmesthorpe Plantation Hedgerow LWS, and Elmesthorpe Boundary Hedgerow pLWS;

- provision of a large wildlife area (approximately 11.34ha) in the west of the Main Order Limits, comprising open meadow grassland, shrub and tree planting and wetland/SuDS features;

- provision of habitat (11.33ha) to the south of the A47 link road proposals to complement and buffer the Burbage Common habitats; and

- provision of new structural and hedgerow planting in addition to connected aquatic/ Sustainable Drainage systems (SuDs) features.

12.129 An assessment of likely significant effects of the Proposed Development on the ecological features identified above has been undertaken based on the parameter plans, which incorporate a level of 'inherent' mitigation, as described above, included as a result of an iterative assessment and design process. An evaluation of IEFs has been made with reference to CIEEM's Ecological Impact Assessment Guidelines (CIEEM, 2019).

12.130 The guidelines advocate an approach to valuing features that involves professional judgement based on available guidance and information, together with advice from experts, who know the locality of the project and/or the distribution and status of the species or features that are being considered.

12.131 The likely effects are assessed with the inherent mitigation included, but in the absence of any additional mitigation measures required to ameliorate likely significant effects.

12.132 The Proposed Development comprises two main stages; namely the construction phase, comprising all site preparation works and construction of all buildings, associated infrastructure and landscaping; and the operational phase comprising the long-term occupation.

Construction impacts and effects

12.133 Whilst exact details of the construction methods to be used cannot be determined with absolute certainty at this time, the details of the parameters have been fixed for the purposes of this assessment and are described within PEIR Chapter 3. These include:

- the demolition of the existing buildings within the site;

- the demolition of the existing hump-back bridge over the Leicester to Hinckley railway on Burbage Common Road;

- the remodelling of the natural terrain inside the HNRFI site to provide two level plateaux for development;

- the construction of the railport, B8 buildings, energy centre, site hub, lorry park and associated facilities;

- the highways and railway work;

- the noise attenuation, drainage works, utilities and landscape and habitat creation works; and
- connection to the rail network.

12.134 Likely impacts identified which could arise as a result of the construction of the development in absence of mitigation include the following:

- Impacts of direct habitat loss and fragmentation/severance due to land take upon habitats and species;
- Indirect impacts to habitats and species due to habitat degradation and damage;
- Impacts of noise, light and human disturbance to species; and
- Pollution of groundwater and surface water flows, as further identified and evaluated in ES Chapter 14 and 15.

Designated sites

Statutory Designations

12.135 Owing to the development buffer afforded to Burbage Wood and Aston Firs SSSI (minimum buffer of approx. 25m at its closest point to built development) and the woodland habitat for which it has been designated, no direct impacts are anticipated during construction of the Proposed Development. However, there remains a low risk that the SSSI may be subject to indirect degradation impacts, such as soil compaction and encroachment by machinery or pollution events resulting from adjacent construction works and material storage. Such temporary negative effects are considered to be significant at a Site to Local level owing to the low risk and limited extent and magnitude of such likely impacts.

Non-statutory Designations

12.136 With respect to non-statutory designations, Elmesthorpe Plantation Hedgerow LWS, Field Rose Hedgerow LWS, Woodland adj. to Aston Firs pLWS, Junction 2 Grassland pLWS, B4669 Road Verge pLWS and Elmesthorpe Boundary Hedgerow pLWS are being retained and afforded a development buffer; and the Borrow Pit LWS, Billington Rough LWS, Hay Meadow LWS, Castlewood Grassland pLWS, Home Farm Grassland pLWS, Trackside Meadow cLWS and Stanton Road Verge 2 pLWS are all off-site, such that no direct impacts on any of these designations are anticipated during construction of the Proposed Development.

12.137 However, there remains a low risk that these designations may be subject to indirect degradation impacts, such as soil compaction and encroachment by machinery or pollution events resulting from adjacent construction works and material storage. Such

temporary negative effects are considered to be significant at a Site to Local level owing to the low risk and limited extent and magnitude of such likely impacts.

12.138 Burbage Common Road Railway Bridge pLWS will be lost to the proposals and although further surveys have shown that the pLWS would be unlikely to qualify as a full LWS it is still regarded as having value at the local level. Therefore, there would be a permanent negative effect considered to be significant at a Local level owing to magnitude of such impacts.

12.139 Although Burbage Common Road Hedgerows pLWS will be retained, it will be subject to permanent direct impacts through its severance in several places to facilitate new internal road access points. Such negative effects are considered to be significant at a District Level, owing to the permanent loss of habitat and habitat connectivity.

12.140 There also remains a low risk that this pLWS may be subject to indirect degradation impacts, such as soil compaction and encroachment by machinery or pollution events resulting from adjacent construction works and material storage. Such temporary negative effects are considered to be significant at a Site to Local level owing to the low risk, limited extent and magnitude of such likely impacts and to the fact that the hedgerow will be buffered from the development along most of its length.

12.141 Freeholt Meadow pLWS will also be permanently lost to facilitate the provision of a new access road from Junction 2 of the M69. The habitat is degraded and can no longer be considered to be of above Local level value, and the permanent loss of the pLWS is therefore considered to also be significant at a Local level.

Habitats

Hedgerow and Mature Tree Network

12.142 The Proposed Development has been designed to retain as many mature scattered trees as possible. However, the unavoidable loss of approximately 258 scattered mature and early mature trees is anticipated to facilitate the Proposed Development. The direct loss of these trees is considered to be of high magnitude and extent. In the absence of further mitigation, such permanent impacts are therefore certain to constitute a significant negative effect at a District level.

12.143 In addition, during the construction phase retained mature trees may be subject to indirect degradation impacts, such as soil compaction and encroachment by machinery resulting from adjacent construction works. In the absence of mitigation, the extent and magnitude of such temporary impacts, although uncertain, is evaluated to be relatively low owing to such retained habitat being predominantly restricted to the GI corridors. Such temporary negative effects are therefore only considered to be at a Site level and not significant in EIA terms.

12.144 The Proposed Development has been designed to incorporate the hedgerow network and minimise its fragmentation where possible, particularly around the perimeters. However,

large losses are unavoidable given the nature of the Proposed Development. The approximate anticipated extent of direct loss based on the Illustrative Landscape Strategy is provided (see Figure 11.15) in Table 12.5.

Table 12.5: Summary of predicted hedgerow loss.

Category of hedgerow	Total length (m)	Loss (m)	Loss (% of total)
Species-rich hedgerows with trees - intact	4,130	2,370	57.38
Species-poor hedgerows with trees - intact	680	390	57.350
Species-poor hedgerows with trees - defunct	90	0	0.0
Species-rich hedgerows - intact	7,900	5,790	73.29
Species-rich hedgerows - defunct	1,240	1,020	82.26
Species-poor hedgerows - intact	4,540	4,120	90.75
Species-poor hedgerows - defunct	300	300	100
Total	**18,880**	**13,990**	**74.10**

12.145 The direct loss and fragmentation of the existing hedgerow network is considered to be of high magnitude and extent. In the absence of further mitigation, such permanent impacts are therefore certain to constitute a significant negative effect at a District level.

12.146 In addition, during the construction phase retained hedgerows may be subject to indirect degradation impacts, such as soil compaction and encroachment by machinery resulting from adjacent construction works. In the absence of mitigation, the extent and magnitude of such temporary impacts, although uncertain, is evaluated to be relatively low owing to such retained habitat being predominantly restricted to the GI corridors. Such temporary negative effects are therefore only considered to be at a Site level and not significant in EIA terms.

Broadleaved Semi-natural and Plantation Woodland

12.147 All of the broadleaved semi-natural woodland will be retained and provided with a reasonable buffer from the Proposed Development. The broadleaved semi-natural woodland is therefore not at risk of direct impacts during construction. However, as discussed above, there remains a risk, albeit low, that indirect degradation impacts resulting from adjacent construction works may arise. Owing to the low risk and limited extent and magnitude of such impacts, the effect is considered to be temporarily negative at a Site level only and not significant in EIA terms.

12.148 A total of 0.4ha of broadleaved plantation woodland will be lost to facilitate the Proposed Development. This loss is considered to be temporary as much larger areas of new woodland planting will be created, forming ecological and landscape buffers around the Proposed Development. The effect will therefore be temporary, direct loss and is considered to constitute a negative effect which is reversible. The significance of such effects in the absence of mitigation is considered to be at a Site level and as a result is not significant in EIA terms.

Ponds

12.149 The unavoidable loss of five ponds (an area measuring approximately 0.48ha in total) is anticipated to facilitate the Proposed Development. The direct loss of these ponds is considered to be of moderate magnitude and extent. In the absence of further mitigation, such permanent impacts are therefore considered to constitute a significant negative effect at a Local level.

Wet Ditches

12.150 All of the permanently wet ditches will be retained and provided with a reasonable buffer from the Proposed Development. They are therefore not at risk of direct impacts during construction. However, as discussed above, there remains a risk of indirect negative impacts arising from vehicular encroachment and silt laden/polluted run-off entering the ponds. Most of the waterbodies currently appear to be subject to low level pollution and sediment run-off from the surrounding intensively farmed arable fields. In light of this, such temporary and reversible impacts, although uncertain and potentially of moderate

magnitude, would result in a negative effect at a Site level only and therefore not significant.

Stream

12.151 The re-routing of the existing stream corridor along its length is unavoidable to facilitate the Proposed Development. The stream will also need to be culverted at certain points along its length to pass beneath new roads. The stream will, however, be reinstated along a new course, allowing for a naturalistic profile and the establishment of vegetation which is currently absent. Due to its connectivity with the wider landscape, the re-routing of the stream is considered certain to be a permanent, significant negative effect at a Local level.

12.152 The culverting of the stream under new roads has the potential to sever connectivity with the wider landscape and will reduce the extent of stream habitat. Such direct impacts are considered certain to be moderate in magnitude, causing permanent, negative effects significant at up to a Local level.

12.153 Furthermore, in the absence of additional mitigation, the watercourse could be at risk of indirect negative impacts arising from vehicular encroachment and silt laden/polluted run-off entering the water. The magnitude of such indirect impacts during construction is uncertain given that it is only a possibility of happening, however, given the development offset incorporated within the design and that development is only proposed near a relatively small section of the brook, such negative indirect effects are considered to be significant at up to a Local level.

Semi-improved Neutral Grassland

12.154 Due to its positioning along the M69 corridor, almost all of the semi-improved neutral grassland will be retained and provided with a reasonable buffer from the DCO proposals. The majority of the grassland is therefore not at risk of direct impacts during construction. However, as discussed above, there remains a risk, albeit low, that indirect degradation impacts (including pollution events, deposition or storage of materials and compaction) resulting from adjacent construction works may arise. Owing to the low risk and limited extent and magnitude of such impacts, the effect is considered to be temporarily negative at a Site level only and not significant in EIA terms.

12.155 A minor loss of grassland on the road verge to the south of Freeholt Meadow to allow the construction of a new access road is expected as part of the Proposed Development. Such direct, permanent, negative impacts are considered significant at up to a Local level.

Species

Winter Bird Assemblage

12.156 Given the prevalence of over-winter species within open, arable land and associated hedgerows in the centre of the Main Order Limits, the loss of such refuge and foraging habitats during construction has the potential to have significant effects on the wintering

bird assemblage. Many of the declining farmland species over-wintering and breeding on site (e.g. skylark, fieldfare, lapwing and to a lesser extent yellowhammer and linnet) utilise these habitats exclusively and would be displaced into the surrounding farmland (for example to the north). Given the extent of permanent agricultural habitat loss the impact would be of relatively high magnitude and therefore would result in a permanent significant negative effect at a Local level on over-wintering farmland birds. The negative effect on more generalist species, including many of conservation concern (e.g. song thrush, starling, house sparrow), would not be significant.

12.157 In the absence of mitigation, disturbance of other retained habitat through noise, visual and human disturbance during construction is likely to be moderate in extent and duration. While many of the urban fringe species present are likely to already be habituated to some level of disturbance (presence of dog walkers/proximity of urban edge), as a precaution this temporary negative effect is considered to be significant at a Local level.

Breeding Bird Assemblage

12.158 In view of the inherent mitigation measures reflected in the retention of notable habitat features within the design layout, the loss and degradation of potential bird nesting and foraging habitats during construction will primarily be restricted to arable farmland and internal hedgerow and tree habitat. Given the extent of permanent agricultural habitat loss, the impact would be of relatively high magnitude and therefore would result in a permanent significant negative effect at a District level on farmland birds, particularly those that nest on the ground. The negative effect on more generalist species, including many of conservation concern (e.g. song thrush, starling, house sparrow), would not be significant.

12.159 The direct killing or harm to birds at the nest (and their eggs and young) could potentially arise during construction works if undertaken during the breeding season. Such impacts would be an offence under the Wildlife and Countryside Act (1981) (as amended). Avoidance of direct killing/injury, to ensure legal compliance, is therefore assumed to be inherent mitigation such that no significant effects will occur in this respect.

12.160 In the absence of mitigation, disturbance of retained nesting and foraging habitat through noise, visual and human disturbance during construction is likely to be moderate in extent and duration. While many of the urban fringe species present are likely to already be habituated to some level of disturbance (presence of dog walkers/proximity of urban edge), as a precaution this temporary negative effect is considered to be significant at a Local level.

Bat Assemblage

12.161 It is anticipated that approximately 63 trees will be lost that contain bat roosting potential (10 with high potential to support roosting bats, 17 with moderate potential and 36 low potential) as a result of the Proposed Development. While the loss of potential roosting resource is not currently considered to be significant in EcIA terms, owing to the transitory

nature of roosts, particularly tree roosts, these features may become occupied by roosts in future that would be subject to legal protection. As such, they require further consideration with respect to update surveys and mitigation to ensure there is no breach of legislation, as discussed further subsequently.

12.162 All existing buildings within the Main Order Limits will also be lost, including two confirmed bat roosts and five buildings with medium potential to support roosting bats. Whilst the loss of potential roosting resource is, again, not currently considered to be significant in EIA terms, in the absence of additional mitigation, the loss of two confirmed roosts, given their consistent use throughout the summer by two species of bat (*Plecotus auritus* and *Pipistrellus pipistrellus*), is likely to result in a permanent, negative effect significant at a Local level.

12.163 The destruction of a known bat roost, and/or direct killing or harm to bats would be an offence under the Conservation of Habitats and Species Regulations 2017 (as amended). Avoidance of direct killing/injury, and roost destruction under a Natural England European Protected Species (EPS) Licence, to ensure legal compliance, is therefore assumed to be inherent mitigation such that no significant effects will occur in this respect.

12.164 Despite the Proposed Development layout retaining and buffering the key habitat features and corridors around the perimeter, such as the woodland copses and part of the hedgerow and tree network, as outlined under the hedgerow/tree line subsection, approximately 13,990m of hedgerow will be lost, including several hedgerow breaches resulting from the road layout. This is likely to have a detrimental impact upon the local bat assemblage's ability to move and forage across the local landscape. In the absence of mitigation, the negative effect of the direct and permanent habitat loss and severance impacts of the Proposed Development on the bat assemblage is considered to be likely significant at a Local level.

12.165 Indirect disturbance (e.g., light spill, visual and noise) of retained commuting, foraging and potential roosting habitat, may also result from adjacent site works during construction. In light of the inherent buffering afforded to retained habitat features such as the woodland and partial hedgerow/tree network, and anticipated restrictions in working hours at night, it is considered that the magnitude and extent of such temporary impacts upon the bat populations would be minimised and therefore not significant.

12.166 Furthermore, the most commonly recorded bats (*Pipistellus pipistrellus, Nyctalus noctula*), are not considered to be particularly sensitive to lighting impacts when foraging or commuting[2]. However, due to the uncertainty regarding the magnitude and extent of such impacts, a precautionary approach to the assessment of effects has been adopted. Such likely negative effects on the bat assemblage, although likely to be low and temporary, are therefore considered to be potentially significant at a Local level.

[2] Stone, E.L. (2013) Bats and lighting: Overview of current evidence and mitigation.

Badger

12.167 Badgers have not been considered as an IEF due to their importance at a geographic scale, however, they are included as an IEF owing to the legal protection they are afforded. A subsidiary and an outlier sett will be completely lost as a result of the Proposed Development. Given the extent of the Proposed Development, it was not possible to retain the setts.

12.168 It is assumed that all of the currently active holes/setts would be directly lost or impacted by construction works in their vicinity. There is therefore a risk of directly killing or harming badgers within their holes during construction. In addition, badgers could be indirectly and temporarily disturbed by noise, vibration and or lighting from construction activities around the badger sett, in addition to the loss and disruption of foraging habitat. This in turn could result in loss of condition/vigour of adults and reduced breeding success.

12.169 The direct killing or injury of badgers and/or disturbance of badger setts would be an offence under the under the Protection of Badgers Act (1992). Avoidance of direct killing/injury, and sett disturbance or destruction under a NE Licence, to ensure legal compliance, is therefore assumed to be inherent mitigation such that no significant effects will occur in this respect.

Otter

12.170 Due to the re-routing of the stream along part of its length, there will be no permanent, direct loss of otter habitat during construction. However, given the need to culvert the stream to allow new road access, the habitat is likely to become fragmented. The provision of outfalls from the drainage strategy and construction of head walls may also disturb the banks of the watercourse. As no otter resting places (holts) were recorded during the survey there is little possibility of having an adverse impact on the species.

12.171 However, in the absence of mitigation, disturbance of retained riparian habitat through noise, visual and human disturbance during construction is likely to be moderate in extent and duration owing to the phasing of the Proposed Development over a number of years. While the population of otter utilising the habitats adjacent to the Main Order Limits is small and this species is known to tolerate relatively high levels of disturbance[3], as a precaution this temporary negative effect is considered to be potentially significant at a Local level.

European Hare

12.172 Due to the breeding behaviour of hares, which tend to make use of open fields and hedgerows, the loss of almost all arable land and much of the hedgerow network within the Site will mean an almost total loss of habitat for the species. The loss of arable habitat is therefore considered to cause a certain, permanent, negative effect significant at a Local level.

[3] Crawford, A.K., (2010) The fifth otter survey of England 2009 – 2010. Environment Agency, Bristol

Common Toad

12.173 As discussed above, all five ponds will be lost. Although no breeding behaviour was witnessed, and no eggs found, juvenile and adults toads were found across the Main Order Limits. Toads were also present within terrestrial habitat surrounding the ponds, including rough field margins and the hedgerow network. Despite this, 21 new ponds will be constructed as part of the proposals, mostly situated within or near new grassland, woodland and hedgerow habitats, meaning that the loss of habitat will be temporary.

12.174 The temporary loss of the ponds and surrounding terrestrial habitat is therefore considered likely to cause temporary, negative effects significant at up to Local level.

Occupational impacts and effects

12.175 Likely impacts identified, which could arise as a result of the operation of the Proposed Development in the absence of mitigation include the following:

- Impacts of light and noise/visual/human disturbance to habitats and species;
- Increased risk of nitrogen deposition on sensitive habitats due to increased air pollution;
- Increased risk of collision to species arising from increased traffic movements; and
- Alteration of groundwater flows.

Designated sites

Statutory Designations

12.176 Burbage Wood and Aston Firs SSSI and Burbage Common and Wood LNR are considered to be at risk of indirect impacts resulting from increased air pollution as a result of increased traffic relating to the Proposed Development. It is also considered possible that indirect impacts may result from changes to the local hydrology. Although the integrity of the mature trees themselves is unlikely to be significantly harmed, it is possible that the woodland ground flora would suffer from the effects of nitrogen deposition.

12.177 The Air Quality Chapter (chapter 9) has considered the effect of the Proposed Development on the deposition of nutrients and has concluded that the Proposed Development would not give rise to any additional deposition during the operational phase.

12.178 Disturbance-related impacts have, to some degree, been inherently mitigated through the provision of buffer and screen woodland planting, including the provision of a new wildlife area in the west and significant areas of GI throughout the Proposed Development. However, there remains a small disturbance risk and given the ecological interest features

of the SSSI and LNR, it is considered that the extent and magnitude of such reversible impacts, although uncertain, would be significant at up to a National level.

12.179 There is a possible risk of increased recreational disturbance to the Burbage Wood and Aston Firs SSSI and Burbage Common and Wood LNR due to increased footfall. However, this is considered to be minimal due to the commercial nature of the Proposed Development. The increase would be minimal by comparison to residential development and would generate very little additional dog walking activity. There is the potential for existing recreational users of the Main Order Limits Site to be displaced towards the SSSI and LNR. In the absence of further mitigation, these factors could potentially result in a permanent, reversible significant negative effect at a County to National Level.

Non-statutory Designations

12.180 Field Rose Hedgerow LWS, Elmesthorpe Plantation Hedgerow LWS, Woodland adjacent to Aston Firs pLWS, Elmesthorpe Boundary Hedgerow pLWS and Burbage Common Road Hedgerow pLWS are not considered to be at risk of operational impacts, due to landscape buffer, and the nature of the development.

12.181 The risk of possible degradation to the Borrow Pit LWS, Billington Rough LWS and Hay Meadow LWS from nitrogen deposition due to increased traffic in the area has been considered as part of the air quality assessment. This concluded that the Proposed Development would not give rise to any significant additional deposition during the operational phase and therefore such impacts are not taken forwards for assessment in this Chapter.

12.182 Similarly, the risk of possible degradation to the Castlewood Grassland pLWS, Junction 2 Grassland pLWS, B4669 Road Verge pLWS and Stanton Road Verge 2 pLWS from nitrogen deposition due to increased traffic in the area has been considered as part of the air quality assessment. This concluded that the Proposed Development would not give rise to any significant additional deposition during the operational phase and therefore such impacts are not taken forwards for assessment in this Chapter.

12.183 The potential of degradation due to changes in hydrology to Billington Rough LWS has been assessed as part of the Hydrogeological impacts at chapter 15. This conclusdes that there will be no significant changes to the local hydrology and therefore such impacts are not taken forwards for assessment in this Chapter.

Habitats

12.184 Important habitats which are to be fully or partially retained within the Proposed Development would be at risk of impacts during the lifetime of the Proposed Development from damage/incursion by commercial tenants, deterioration through a lack of management, increased levels of air pollution and/or changes in the quality and volume of water run-off.

12.185 As a result of inherent mitigation built into the scheme design, much of the retained hedgerow/tree/woodland network and the redirected watercourse fall within areas of open space that contain new attenuation features. This helps to minimise the potential for such impacts to arise and allows for long-term centralised management through the establishment of a management company. Such negative reversible effects on these habitats during operation are therefore judged to be of influence at a Site Level, rather than the Local and District level values ascribed to these IEFs, and therefore not significant.

Species

Breeding and Wintering Bird Assemblage

12.186 Retained habitats supporting breeding, foraging and over-wintering birds are likely to be at risk of disturbance and damage during the operational phase of the Proposed Development. Increased vehicular traffic arising following occupation could also increase risk of collision to bird species moving across the Proposed Development.

12.187 Owing to the buffer afforded to retained habitats such permanent and irreversible negative impacts are considered to be relatively low in magnitude and only of influence at a Site Level and therefore not significant.

Bat Assemblage

12.188 The Proposed Development could result in light spill and disturbance to foraging, commuting and potentially roosting bats along retained habitats during the operational stage of the Proposed Development. Such impacts have been minimised through inherent buffer afforded to the main commuting and foraging habitat features such as the woodland, hedgerow and tree network. Furthermore, bats will be at increased risk of traffic collision.

12.189 In the absence of further mitigation, this could potentially result in a permanent, irreversible, significant negative effect at a Local level.

Badger

12.190 Badgers are likely to be at higher risk of collisions with vehicles and disturbance from humans. However, recognising that opportunities are present in suitable adjacent farmland off-site and within new woodland areas, and this species' ability to successfully adapt to and inhabit urban areas, combined with the species value, such permanent, irreversible negative effects will at most be significant at a Site level.

Otter

12.191 Otters will potentially be at risk of collisions with vehicles and disturbance by humans associated with the new development. Unforeseen pollution incidents or other impacts upon water levels and water quality of the stream may also impact upon otters utilising this feature.

12.192 However, recognising that opportunities are present in suitable adjacent habitat off-site up and down stream and owing to this species known tolerance of high levels of disturbance, such permanent, irreversible negative effects are considered significant at a Local level.

Common Toad

12.193 The Proposed Development could result in light spill and disturbance to aquatic and terrestrial habitats supporting common toad during the operational stage. Such impacts have been minimised through inherent buffer afforded to the main suitable habitat features such as the waterbodies and hedgerow network. Furthermore, common toad will be at increased risk of traffic collision.

12.194 Unforeseen pollution incidents or other impacts upon water levels and water quality of new waterbodies may also impact upon great crested newt utilising these features.

12.195 In the absence of further mitigation, these factors could potentially result in a permanent, irreversible significant negative effect at a Local Level.

PROPOSED MITIGATION

12.196 Overall, negative effects have been avoided or reduced through inherent mitigation incorporated into the parameters plan (see PEIR Chapter 2) and Illustrative Landscape Strategy (see Figure 11.15). However, not all likely significant negative effects can be avoided or reduced in severity through inherent mitigation alone. This section identifies those additional mitigation measures required to avoid, reduce or offset the likely significant negative impacts. The key mechanisms described will include measures to:

- Conform with relevant and pertinent legislative requirements, particularly those associated with legally protected species;
- Mitigation measures to replace habitats of value lost and to provide habitat for species identified as IEFs; and
- Deliver and, where possible, maximise opportunities for biodiversity enhancement and gain through the proposals.

12.197 The key mechanisms which would be implemented are:

- Detailed Design Measures – The submitted designs, such as the Landscape Strategy, are illustrative and allows flexibility for specific detailed design measures to be secured and included within the Proposed Development. However, those measures identified within this document and detailed within the Landscape Strategy are considered necessary and therefore should be secured through suitably worded requirements in the DCO. Aspects of the detailed design which are especially relevant are as follows:

- External lighting – to be designed to avoid impacts on nocturnal wildlife where in close proximity to retained habitats;

- Surface water drainage system – to be designed to maintain/improve water quality and maintain existing run-off rates, and provide additional wetland habitat; and

- Soft landscape scheme (SLS) – to be designed to include new habitats of ecological value within the public open space.

- An Ecological Construction Method Statement (ECMS) will form an appendix to the Construction Environmental Management Plan (CEMP) – This will set out in detail the measures which will require implementation with respect to IEFs during the demolition and construction phase of the Proposed Development. It is proposed that the methodologies prescribed within the ECMS will be overseen by an appointed Ecological Clerk of Works (ECoW). An ECoW would be appointed by the principal developer and provide advice about ecological and environmental issues during the construction of a development. The ECoW will monitor works to ensure compliance with relevant legislation, planning conditions and associated documents and to help reduce risks and delays. The ECoWs scope and remit will be set out within the ECMS. The ECMS and appointment of the ECoW could be secured by way of a suitably worded DCO requirement. A Framework CEMP setting out more general environmental control measures during construction (e.g. pollution control) will be submitted with the DCO. A detailed CEMP for the Proposed Development, or phases of the Proposed Development could be secured by way of a suitably worded DCO requirement; and

- Landscape and Ecology Management Plan (LEMP) – This will set out the measures for the ongoing management, maintenance and monitoring of the IEFs and of those newly created habitats to maximise opportunities for biodiversity enhancement and gain. Owing to the number and duration of development phasing proposed, a strategic site-wide LEMP will be produced and submitted as part of the DCO application. This will provide a holistic framework to which subsequent detailed development phase LEMPs should accord. The detailed LEMPs could be secured by way of a suitably worded DCO requirement.

12.198 The proposed mitigation in respect to the likely negative effects of construction and during operation, even if not considered to be significant in EIA terms (i.e., effects that are significant at less than the Local level) are described below.

Construction

12.199 Prior to commencement of any clearance or construction works, further tree climbing inspections are to be undertaken during the bat active season (April to September inclusive) of the small number of trees with moderate or higher bat roosting potential that will be impacted by the Proposed Development, as noted within Technical Appendix 12.1.

12.200 Detailed species surveys will be updated prior to commencement of the development or relevant phase of development as appropriate depending upon the final development programme. The findings will be used to inform the measures set out below.

12.201 Detailed measures to protect habitats and species during the construction phase will be set out in an ECMS which would be secured through an appropriately worded pre-commencement requirement forming part of the DCO. The ECMS will cross reference the Arboricultural Method Statement (AMS) prepared earlier as part of the application, and will be included as an appendix to the CEMP.

Designated Sites and Habitats

12.202 The ECMS will contain measures to ensure that the statutory and non-statutory designated sites and all valued habitats retained within and adjacent to the Proposed Development are fully protected during construction activities.

12.203 Measures will include the establishment of Ecological Protection Zones (EPZs), protected by fencing and signage to prevent activities such as the incursion by vehicles or personnel, fires and stockpiling of materials.

12.204 Further measures for the aquatic features (the stream corridor, pond and ditch network) will include implementation of best practice to ensure that any discharge of surface water into the natural environment is of acceptable levels and quality, as further assessed within ES Chapter 14, and the risk of likely pollution events including spills, leaks and other incidents during the construction phase will be minimised through adherence to best practice such as the 'former' Environment Agency's Pollution Prevention Guidance Notes (PPGs), which are still considered current best practice.

12.205 Subject to implementation of the above measures, construction effects on these IEFs will be reduced to not significant levels. Habitat losses will be addressed through new habitat creation during and after construction; this is discussed further under the operational mitigation section.

Species

12.206 Protection of species during construction will be ensured through the provisions of the ECMS. As a general measure aimed at protecting species, 'tool box briefings' will be provided by a suitably qualified ecologist to the principal contractor appointed by the developer, for distribution to all employees involved in any enabling works/vegetation clearance. This will ensure that identification and protection of the relevant species and their habitats is understood.

12.207 In addition to the habitat protection measures described above, which will deliver much of the necessary species protection, further measures to be included in the ECMS for each species group are summarised below:

Birds

- Retained nesting habitats included within EPZs; and
- Removal of potential nesting habitat will be undertaken outside the bird breeding season (namely March to August inclusive) unless a detailed survey by a suitably experienced ecologist has confirmed that no nests are present in the affected area immediately prior to works commencing.

Bats

- Retained trees with bat roost potential included within EPZs;
- Restricted working hours and use of lighting to minimise disturbance to bat foraging and commuting habitats;
- Update surveys of trees with bat roost potential prior to felling/pruning. If bat roosts are confirmed present, cessation of works until an appropriate strategy is devised and agreed under licence with NE to ensure that there is no contravention of the legal protection afforded to bats. In the event that this is required, retained trees and/or proposed new buildings would provide ample opportunity to provide replacement roosting habitat to mitigate any losses, thereby maintaining the favourable conservation status of the bat population and ensuring that a licence would be granted by NE; and
- Similarly, an appropriate strategy for the removal of bat roosts within existing buildings will be devised and agreed under licence with NE, including identification of suitable mitigation.

Otter

- Otters will be excluded from the watercourse and all associated riparian habitat throughout construction, particularly during the establishment of the redirected stream channel. Retained lengths of the stream will be included within EPZs;
- Update surveys of riparian habitat to be affected by outfall construction to check for Otter resting places;
- Restricted working hours and use of lighting to minimise disturbance to otter foraging and commuting habitats; and
- Good practice construction measures to ensure otters are either unable to access the construction site or cannot become trapped in excavations (e.g. through covering up at night or inserting an ‘escape ramp’).

Badger

- Update badger survey prior to works commencing;
- Assuming the setts identified as being impacted by the Proposed Development continue to be active following update surveys, temporary and/or permanent sett closure under a NE Licence will be required. The level of closure will be dependent on the detailed design and an appropriate mitigation strategy agreed via licencing to ensure that works are carried out legally. Any closure will take place outside of the breeding season (July to November inclusive) using one-way gates. If required, an alternative sett would be created within nearby green space that is not subject to very high levels of disturbance and has appropriate green corridors connecting it with the wider landscape, in advance of the sett closure. The areas of higher ground within the boundary landscape areas and the southwest amenity open space area within the Main Order Limits presents a suitable location. Following 21 days of no activity development works could commence with the gates only removed following completion of the ground works; and
- Good practice construction measures to ensure badgers are either unable to access the construction site or cannot become trapped in excavations (e.g. through covering up at night or inserting an 'escape ramp').

Invertebrates

- Retained habitats included within EPZs; and
- New habitat will be created and enhanced to provide opportunities for invertebrates during the construction period and post development, as described above.

12.208 Subject to the above being implemented, construction effects on species will be avoided or mitigated to provide a not significant impact.

Operation

12.209 A Landscape and Ecological Management Plan (LEMP) or plans, , will be developed to ensure the long-term conservation of retained and created environmental resources, including habitats and species of ecological value. The overarching LEMP will be drawn up in parallel with the Landscape Scheme for the Proposed Development, which will include detailed specifications for the planting/creation of new habitats.

12.210 It will be necessary for the LEMP to be developed further prior to the initiation of the construction phase and it is proposed that the Strategic LEMP forms the basis for subsequent LEMPs for each reserved matters Phases coming forward. It will also be necessary, prior to the construction phase, to identify the implementation responsibilities of the management plan through the initial contractor and future management through a management company.

12.211 The Ecological Management Plan (EMP) will set out the objectives and principles covering the construction phase and long-term management of ecology interests. Monitoring of the effects of the implemented measures will form the basis for any revision of the scheme.

Statutory Designations

12.212 There is considered to be a potential risk of negative indirect impacts upon Burbage Wood and Aston Firs SSSI resulting from increased recreational pressure associated with the Proposed Development. The following mitigation measures are therefore proposed:

- The production of an Access Management Plan, which will detail:
    - An access and movement management strategy, that details the location and routes of proposed and existing access points and permitted routes for walking within the Proposed Development as an alternative to the woodland. This will also detail how measures will be implemented to restrict access into more sensitive areas, such as wet woodland and encourage responsible use of the woodland through the provision of information and signage within the Proposed Development; and
    - A monitoring programme to ensure that the measures being implemented are fit for purpose and that the woodland is not being detrimentally affected.
- Funding/responsibility for ongoing management and monitoring.

12.213 The Management Plan will be drawn up with input from interested parties such as NE, Woodland Trust and the LPA prior to submission of the DCO application to ensure that full local engagement can be secured.

12.214 Subject to the implementation of the above measures, indirect adverse impacts from recreational pressure would be reduced to not significant levels (i.e. negative at a Site level only). Although this assertion carries a degree of uncertainty, any not significant residual negative impacts would also be compensated through adjacent complimentary planting and grassland establishment within the landscape boundary areas, the amenity open space and the area to the south of the A47 Link Road, which will also be enhanced through active management.

Non-statutory Designations and Habitats

12.215 The EMP would include measures to restore, maintain and enhance the non-statutory designations and other valued habitats on-site, including the grassland, hedgerows, trees and woodland, in order to increase their resilience and mitigate long-term disturbance effects. In addition, the EMP would include measures to establish and maintain new habitats of long-term ecological value within the Proposed Development's open spaces.

12.216 The extent of important ecological habitats within the Main Order Limits, and the quantities retained, lost and proposed, have been assessed using the DEFRA Metric 3.0 Biodiversity Impact Assessment (BIA) Calculator. These BIA calculations, which are provided in Technical Appendix 12.2, have been used to objectively provide an overall biodiversity score for the Proposed Development.

12.217 It should be noted that this score is based on the Illustrative Landscape Strategy and has been calculated with a number of assumptions based on defined parameters set out within the Technical Appendix 12.2. It will therefore be subject to some variance at the detailed design stage. However, subject to the delivery of appropriate conditions relating to habitat provision and management, this is considered to be an appropriate plan for assessing the overall biodiversity impact of the Proposed Development.

12.218 As shown in Technical Appendix 12.2, the Proposed Development does not achieve 10% net biodiversity gain in either linear habitats and habitat areas. The Proposed Development will therefore require either contributions towards off-site habitat creation and/or enhancement and/or the provision of an offsite area of land to be provided in connection with the Proposed Development, in order to offset the number of negative units calculated and provide the 10% net gain. The BIA calculations (see Appendix 12.2) have identified the area of land that would be required to achieve this and is being progressed. Provided this is achieved, the Proposed Development will be in accordance with national and local planning policy, which requires developments to achieve no net loss in biodiversity, and will aim to provide a minimum of 10% net gain in line with the future requirements of the Environment Act 2021.

12.219 Measures to be included within the LEMP to create, enhance and manage habitats are summarised below:

Meadow Grassland

- Sowing of new species-rich meadow grassland across open spaces and sensitively managed to benefit birds, bats, badgers, other small mammals, amphibians, reptiles and invertebrates; and
- Sensitive management of retained semi-improved neutral grassland along the M69 corridor.

Scattered Trees, Scrub and Woodland/Structural Planting

- New native tree and shrub planting within the Proposed Development's wildlife and amenity areas and along the internal roads and boundaries;
- Ongoing viability and safety of tree stock on-site maintained including arboricultural inspections in accordance with industry best practice;
- Pruning of retained and new tree stock as necessary and in accordance with industry best practice; and

- Management of retained woodland parcels (excluding Woodland adjacent to Aston Firs, which is covered above in the non-statutory designations section) through ongoing viability/safety of tree stock maintenance, pruning as necessary, clearance of successional scrub, creation of deadwood piles, litter picking and fencing where appropriate.

Hedgerows/Tree Lines

- Retained hedgerows restored where relevant through selective trimming/laying and planting with native species in gaps;
- Planting new native species-rich hedgerow within the Proposed Development's open spaces that connect green spaces in order to offset some of the losses incurred through the construction of the Proposed Development; and
- Sensitive management of new and retained hedgerows, such as trimming on a rotation to allow plants to develop flowers and fruit in order to enhance value to a variety of wildlife.

Ponds

- Creation and management of SuDS that will not only ensure the rate of surface water run-off from the Proposed Development matches current levels, but would also intercept pollutants and provide habitat for a variety of wildlife; and
- Planting and management of the attenuation features, including the creation of reed beds, to enhance their ecological value and effectiveness at intercepting pollutants, including permanent ponds designed for wildlife.

Watercourse

- Re-profiling of banks following redirection to create a more naturalistic channel, suitable for a range of riparian species;
- The addition of riffles and lags in order to create a variety of niches suitable for a range of invertebrate and fish species; and
- Planting and management of riparian vegetation along the stream corridor.

12.220 The proposed measures described above would ensure the level of net loss in habitats of ecological value is minimised in accordance with the BIA calculations (see Technical Appendix 12.2). The creation of meadow grassland, in addition to hedgerow, woodland, wetlands, the redirection and enhancement of the stream corridor and the contribution towards off-site habitat enhancement or creation could potentially result in a beneficial significant effect on these habitats at a Local level and contribute to an overall net gain in valuable habitats.

Species

12.221 As described above, the LEMP for the Proposed Development would include measures to restore, maintain and/or enhance habitats of ecological value. Provided these habitats are created and maintained in appropriate locations which are accessible to wildlife, this would also benefit valued species occurring within and around the Proposed Development through the provision of enhanced opportunities for breeding, refuge, foraging and/or dispersal. In general terms, these habitats should be sympathetically managed according to protected species interests as detailed within the LEMP. Human related disturbance impacts should be addressed through the appropriate positioning and clear demarcation of routes through the Proposed Development, in addition to the use of strategic structural planting and/or fencing.

12.222 Additional species-specific measures to minimise operational impacts and provide enhanced opportunities for species breeding and refuge would be detailed within the LEMP as summarised below:

Birds

- Management of areas of the wildlife area and other green infrastructure areas to ensure that habitats suitable for nesting skylark, linnet and yellowhammer as well as foraging barn owls are provided;
- Durable bird boxes, including a range of designs to suit different species, will be erected on retained mature trees; and
- Bird nesting features (e.g. swallow/swift ledges and sparrow terraces) will be incorporated into selected new buildings within the Proposed Development.

Bats

- Durable bat boxes, including a range of designs to suit different species, will be erected on retained mature trees;
- Bat roosting features will be incorporated into selected new buildings; and
- A sensitive lighting scheme, which ensures retained and new bat habitats are not illuminated to a level where bat activity is deterred (typically considered to be 1 lux).

Otter

- A sensitive lighting scheme, which ensures the new stream corridor and associated habitats are not illuminated to a level where otter activity is deterred (up to 1 lux);
- Restricting public access to the river corridor through the provision of clear footpaths, fencing and strategic landscape planting to minimise disturbance; and

- Creation of new wetland habitat along the stream corridor.

Badger

- Traffic calming schemes near the retained off-site sett on the western edge of the Main Order Limits, with speed restrictions and/or fencing along the road to reduce the risk of collisions with traffic.

Common Toad

- The retained and new waterbodies across the Proposed Development and wider landscape that support toads will be connected via green corridors to ensure they do not become isolated by the Proposed Development, as well as to ensure sufficient carrying capacity for the population present. In addition, these green corridors will be enhanced through the provision of swales and other attenuation features, installation/maintenance of hibernacula and management to promote a rank grassland sward; and

- A number of the newly created ponds will be enhanced and managed specifically for their potential to support amphibians and other species.

Other Species

- Creation of wood piles to enhance opportunities for invertebrates, amphibians, reptiles and small mammals such as hedgehogs; and

- Low level management of marshy/meadow grassland to create rank and tussocky areas that provide opportunities for reptiles, amphibians, invertebrates and other wildlife.

12.223 Subject to the above, no significant effects on species during the operational phase of the Proposed Development are anticipated.

12.224 With respect to birds, while the farmland assemblage will be displaced into the surrounding landscape, other more generalist conservation concern species recorded, such as song thrush, house sparrow and starlings are likely to benefit from the new habitat creation. It is likely that wetland species will also benefit from the amount of permanent water and SuDs habitat created.

12.225 The appropriate creation and design of woodland, meadow grassland and wetland SUDs habitat could deliver enhanced opportunities for certain bird and bat species, badgers, and also other species present on site and in the wider landscape such as hedgehogs, water voles, amphibians, reptiles and invertebrates.

Future monitoring

12.226 It is recommended that the newly created habitats and the success of bird and bat boxes and the artificial badger sett (if required) is subject to future monitoring following the completion of the development to assess the success of the mitigation strategies detailed within the LEMP. Such monitoring should be detailed within the LEMP and management prescriptions reviewed and amended to reflect the monitoring results and protect these habitat and species interests over the long term.

RESIDUAL ENVIRONMENTAL EFFECTS

12.227 The residual effects are the likely effects occurring following implementation of the design measures, construction phase and operational phase mitigation measures described above.

12.228 The measures proposed are industry-standard and are not novel unproven measures. There is therefore high confidence that such measures will adequately mitigate the likely effects described.

12.229 Subject to the mitigation measures outlined above being implemented, no significant residual effects are anticipated on any designated site, habitat or species.

12.230 It is considered that the enhancement of retained habitats and creation of new habitats could potentially also have a positive (permanent) not significant effect at a Site level on certain species/ecological receptors identified within the Main Order Limits, particularly certain species of birds, bats and invertebrates. Furthermore, the new habitats created would likely provide enhanced opportunities for other species known to be present on site and in the wider landscape, including water voles, hedgehogs and reptiles.

CUMULATIVE AND IN-COMBINATION EFFECTS

12.231 Relative to the location and extent of the Proposed Development, the potential cumulative schemes listed in ES Chapter 20 are all considered to be spatially divorced from the Proposed Development to exert any tangible cumulative in-combination effect on the IEFs with the Proposed Development. However, these will be fully assessed within the full DCO submission.

Cumulative Effects Assessment

12.232 Cumulative effects generally occur where there may be simultaneous or prolonged similar effects on the same habitats or species populations as a result of two or more developments of the same type and scale, or where the consideration of other schemes would increase an effect identified.

12.233 There will be an anticipated further habitat losses and impacts to species that have been identified as IEFs as a result of the other identified developments and therefore the Cumulative Effect would be significant. However, the Biodiversity Impact Assessment calculations (see Technical Appendix 12.2) show that the Proposed Development is aiming to provide a 10% net gain in Biodiversity, through its onsite and offsite mitigation, and it would be expected that the other developments would be required to do the same.

12.234 Any detailed and reserved matters for the other identified Developments would be expected to implement the similar mitigation and enhancement measures, such as the CEMP, ECMS, LEMP and Woodland Management Plan. These should be based on the strategic documents prepared prior to the first reserve matters to ensure a holistic approach is achieved.

12.235 If these measures were to be followed it is concluded that there would be no significant adverse cumulative effects as a result of the other identified developments.

The potential for cumulative effects

12.236 The potential for cumulative effects, caused by the combination of a number of individual effects on identified receptors, have been considered within the assessment as appropriate, by way of considering the Proposed Development as a whole. The effects considered include dust generation, noise, traffic, hydrological effects and landscape effects. These are considered to be the effects which have the greatest potential for adverse effect and are primarily associated with the construction phase of the project.

12.237 A CEMP will be agreed and secured by a relevant DCO requirement and/ or Section 106 Agreement, and implemented, a framework CEMP will be submitted as part of the DCO application. This will provide a mechanism to minimise the effects of demolition and construction work to reduce the potential effects on all receptors.

CLIMATE CHANGE

12.238 Potential climate change projections have been calculated for the proposals and are detailed within ES Chapter 17. In summary, the projections estimate an increase in winter and summer mean and mean daily maximum/minimum temperatures, an increase in winter mean precipitation and a decrease in summer mean precipitation.

12.239 Given that the valued habitats and species within the Main Order Limits are widespread and the location of the Proposed Development is not near the edge of any of their ranges; the projected change in temperatures is not anticipated to result in any significant impacts on the designated site, habitat and species IEFs.

12.240 However, the projected changes in precipitation may have impacts on the aquatic habitats within the Proposed Development, including the marshy grassland, waterbodies and watercourse, and consequently the species associated with them, such as otter, amphibians and invertebrates. It is considered that the generous provision of greenspace

within the Proposed Development, which will be managed to promote biodiversity, the large area of varied SuDs/attenuation features proposed throughout the scheme and the large buffer afforded to the watercourse corridor (with additional aquatic features incorporated within it), will provide sufficient resilience to any likely effects of future climate change.

12.241 Furthermore, future monitoring of the new and retained habitats within the Proposed Development which is to be detailed within the LEMP, as described above in the mitigation section, will allow an opportunity for management prescriptions to be reviewed and amended to reflect any impacts as a result of climate change. This will further safeguard the habitat and species interests over the long term.

SUMMARY AND CONCLUSIONS

12.242 This chapter provides an assessment of the significance and consequences of likely ecological impacts upon identified IEFs arising from the Proposed Development for the HNRFI. It has been prepared by EDP as part of a PEIR for the Proposed Development.

12.243 Avoidance, mitigation and compensation measures have been prepared as part of a holistic ecology strategy for the Proposed Development to address any likely significant effects that may arise during construction and after completion (operation) of the Proposed Development. Additional measures to further ensure all residual effects are avoided, mitigated and compensated for, in addition to further enhancements recommended to enable the Proposed Development to deliver positive ecological gain are also discussed.

12.244 Further baseline information in support of this chapter and subject to pre- consultation discussions with Statutory Consultees is included within the Ecological Baseline (Technical Appendix 12.1) and is referred to throughout the assessment. The approach taken in this assessment is made with reference to the guidelines published in 2018 by the Chartered Institute of Ecology and Environmental Management (CIEEM).

12.245 The baseline survey work has identified the following IEFs pertinent to the Proposed Development:

- Burbage Woods and Aston Firs SSSI;
- Burbage Common and Woods LNR/LWS;
- Field Rose Hedgerow LWS;
- Elmesthorpe Plantation Hedgerow LWS;
- The Borrow Pit LWS;
- Billington Rough LWS;

- Hay Meadow LWS;
- Freeholt Meadow pLWS;
- Woodland adjacent to Aston Firs pLWS;
- Castlewood Grassland pLWS;
- Burbage Common Road Hedgerow pLWS;
- Burbage Common Road Railway Bridge pLWS;
- Junction 2 Grassland pLWS;
- B4669 Road Verge pLWS;
- Elmesthorpe Boundary Hedgerows pLWS;
- Stanton Road Verge 2 pLWS;
- Home Farm Grassland pLWS;
- Trackside Meadow cLWS;
- Semi-improved Neutral Grassland;
- Hedgerow and Tree Network;
- Broadleaved semi-natural and plantation woodland;
- Ponds;
- The stream;
- Wet ditches;
- Winter birds;
- Breeding birds;
- Roosting, foraging and commuting bats;
- Badgers;
- Otters;
- European hares; and
- Common toads.

12.246 The impact assessment has identified that certain actions could result in significant negative impacts on these IEFs without mitigation. Inherent avoidance, mitigation and compensation measures and the implementation of an ECMS, and LEMP are considered to ameliorate those significant impacts identified to a residual level where no significant negative effects are likely. Furthermore, such measures can potentially deliver considerable positive effects with respect to biodiversity gain.

12.247 A summary of those activities during the construction and operational phases of the Proposed Development impacting upon identified IEFs, including the proposed mitigation, enhancement and, where necessary, compensation mechanism, should any residual impacts remain, are provided within Table 12.6.

12.248 Based on the impact assessment and consideration of the IEFs, it is concluded that the Proposed Development will conform to the legislative protection afforded to these IEFs and with national, regional and local planning policy requirements.

Table 12.6: Ecology Assessment Summary.

Ecological Feature	Description of effect	Nature of effect	Significance (pre-mitigation)	Mitigation and enhancement	Residual effect including significance
Construction Effects					
Burbage Wood and Aston Firs SSSI	Indirect degradation and damage	Minor adverse, temporary, reversible, not certain	Significant (Site to Local level)	CEMP (sensitive construction methods, pollution prevention measures); ECMS (protection of retained habitats)	No significant effect
Local Wildlife Sites and pLWS as listed in Table 12.4	Indirect degradation and damage	Minor adverse, temporary, reversible, not certain	Significant (Site to Local level)	CEMP (sensitive construction methods, pollution prevention measures); ECMS (protection of retained habitats)	No significant effect

Ecological Feature	Description of effect	Nature of effect	Significance (pre-mitigation)	Mitigation and enhancement	Residual effect including significance
Hedgerow and Mature Tree Network	Direct loss	Moderate adverse, permanent, irreversible, certain	Significant (District level)	LEMP (enhancement of retained habitat); and SLS (new habitat creation)	No significant effect
	Indirect degradation and damage	Minor adverse, temporary, reversible, not certain	Not significant (Site level)	CEMP (sensitive construction methods, pollution prevention measures); ECMS (protection of retained habitats)	No significant effect
Broadleaved Semi-natural and Plantation Woodland	Direct loss (of plantation woodland)	Minor adverse, temporary, reversible, certain	Not significant (Site level)	LEMP (enhancement of retained habitat); and SLS (new habitat creation)	No significant effect

Ecological Feature	Description of effect	Nature of effect	Significance (pre-mitigation)	Mitigation and enhancement	Residual effect including significance
	Indirect degradation and damage	Minor adverse, temporary, reversible, not certain	Not significant (Site level)	CEMP (sensitive construction methods, pollution prevention measures); ECMS (protection of retained habitats)	No significant effect
Ponds	Direct loss	Moderate adverse, permanent, irreversible, certain	Significant (Local level)	LEMP (enhancement of retained habitat); and SLS (new habitat creation)	No significant effect
Wet Ditches	Indirect degradation and damage	Moderate adverse, temporary, reversible, not certain	Not significant (Site level)	CEMP (sensitive construction methods, pollution prevention measures); ECMS (protection of retained habitats)	No significant effect

Ecological Feature	Description of effect	Nature of effect	Significance (pre-mitigation)	Mitigation and enhancement	Residual effect including significance
Stream	Diversion of existing alignment	Major adverse, permanent, irreversible, certain	Significant (Local level)	CEMP (sensitive construction methods, pollution prevention measures)	No significant effect
	Severance of connectivity by culverts	Moderate adverse, permanent, irreversible, certain	Significant (Local level)	Design of culverts and length of culverts minimised to reduce	No significant effect
	Indirect degradation and damage	Moderate adverse, permanent, irreversible, certain	Significant (Local level)	CEMP (sensitive construction methods, pollution prevention measures)	No significant effect

Ecological Feature	Description of effect	Nature of effect	Significance (pre-mitigation)	Mitigation and enhancement	Residual effect including significance
Semi-improved Neutral Grassland	Indirect degradation and damage	Moderate adverse, permanent, irreversible, certain	Significant (Local level)	CEMP (sensitive construction methods, pollution prevention measures); ECMS (protection of retained habitats)	No significant effect
	Direct loss	Minor adverse, permanent, irreversible, certain	Significant (Local level)	LEMP (enhancement of retained habitat); and SLS (new habitat creation)	No significant effect
Winter Bird Assemblage	Habitat loss	Major adverse effect on declining farmland species, permanent, irreversible, certain	Significant (Local level)	LEMP (enhancement of retained habitat); and SLS (new habitat creation)	No significant effect

Ecological Feature	Description of effect	Nature of effect	Significance (pre-mitigation)	Mitigation and enhancement	Residual effect including significance
	Disturbance (noise, visual and human)	Moderate adverse, temporary, reversible, not certain	Significant (Local level)	CEMP (sensitive construction methods)	No significant effect
Breeding Bird Assemblage	Habitat loss	Major adverse effect on declining farmland species, permanent, irreversible, certain	Significant (District level)	LEMP (enhancement of retained habitat); and SLS (new habitat creation)	No significant effect
	Direct killing and injuring of nesting birds, young and eggs	Not significant (based on inherent mitigation – legal compliance)		ECMS (sensitive timing and method of vegetation clearance)	No significant effect
	Disturbance (noise, visual and human)	Moderate adverse, temporary, reversible, not certain	Significant (Local level)	CEMP (sensitive construction methods)	No significant effect

Ecological Feature	Description of effect	Nature of effect	Significance (pre-mitigation)	Mitigation and enhancement	Residual effect including significance
Bat Assemblage	Loss of confirmed roosting habitat (buildings) and potential roosting habitat (trees)	Minor-major adverse, permanent, irreversible, certain-not-certain	Significant (Local level)	LEMP (enhancement of retained habitat, bat boxes)	No significant effect
	Direct killing and injuring of roosting bats	Not significant (based on inherent mitigation – legal compliance)		ECMS and NE Licence (sensitive timing and method of works)	No significant effect
	Loss of foraging habitat	Moderate adverse, permanent, irreversible, certain	Significant (Local level)	LEMP (enhancement of retained habitat); and SLS (new habitat creation)	No significant effect
	Disturbance (lighting) of foraging habitat	Moderate adverse, temporary, reversible, not certain	Significant (Local level)	CEMP (sensitive construction methods)	No significant effect

Ecological Feature	Description of effect	Nature of effect	Significance (pre-mitigation)	Mitigation and enhancement	Residual effect including significance
Badger	Loss of foraging habitat and potential sett building opportunities	Moderate adverse, permanent, irreversible, certain	Not significant (Site level)	LEMP (enhancement of retained habitat); and SLS (new habitat creation)	No significant effect
	Direct killing or injury and/or disturbance of setts	Not significant (based on inherent mitigation – legal compliance)		ECMS and NE Licence (sensitive timing and method of works)	No significant effect
Otter	Loss/fragmentation of foraging habitat	Minor adverse, permanent, irreversible, certain-not certain	Significant (Local level)	LEMP (enhancement of retained habitat); and SLS (new habitat creation)	No significant effect
	Disturbance (noise, visual and human)	Minor adverse, temporary, reversible, not certain	Significant (Local level)	CEMP (sensitive construction methods); ECMS (protection of retained habitats)	No significant effect

Ecological Feature	Description of effect	Nature of effect	Significance (pre-mitigation)	Mitigation and enhancement	Residual effect including significance
European Hare	Loss of breeding and foraging habitat (arable land)	Major adverse, permanent, irreversible, certain	Not significant (Site level)	LEMP (enhancement of retained habitat); and SLS (new habitat creation)	No significant effect
Common Toad	Loss of breeding and foraging habitat (ponds)	Major adverse, temporary, reversible, certain	Significant (Local level)	LEMP (enhancement of retained habitat); and SLS (new habitat creation)	No significant effect
Operational Effects					
Burbage Wood and Aston Firs SSSI	Recreational pressure	Moderate adverse, permanent, irreversible, certain	Significant (National level)	Woodland Access Management Plan	Not significant (Site level)

Ecological Feature	Description of effect	Nature of effect	Significance (pre-mitigation)	Mitigation and enhancement	Residual effect including significance
Billington Rough LWS	Changes in water quality from on-site pollution	Moderate adverse, temporary - permanent, reversible, uncertain	Significant (County level)	Surface water drainage system (SuDS features)	No significant effect
Habitats	Indirect degradation and damage	Minor adverse, temporary - permanent, reversible, uncertain	Not significant (Site level)	Surface water drainage system (SuDS features); LEMP (enhancement of retained habitat); and SLS (new habitat creation)	No significant effect
Breeding and Wintering Bird Assemblage	Disturbance and collision risk	Minor adverse, temporary - permanent, irreversible, uncertain	Not significant (Site level)	LEMP (enhancement of retained habitat); and SLS (new habitat creation)	No significant effect

Ecological Feature	Description of effect	Nature of effect	Significance (pre-mitigation)	Mitigation and enhancement	Residual effect including significance
Bat Assemblage	Disturbance (lighting) and collision risk	Minor adverse, temporary - permanent, irreversible, uncertain	Significant (Local level)	LEMP (enhancement of retained habitat); SLS (new habitat creation), and sensitive lighting design	No significant effect
Badger	Disturbance and collision risk	Minor adverse, temporary - permanent, irreversible, uncertain	Not significant (Site level)	LEMP (enhancement of retained habitat); and SLS (new habitat creation)	No significant effect
Otter	Disturbance and collision risk	Minor adverse, temporary - permanent, irreversible, uncertain	Significant (Local level)	LEMP (enhancement of retained habitat); and SLS (new habitat creation)	No significant effect

Ecological Feature	Description of effect	Nature of effect	Significance (pre-mitigation)	Mitigation and enhancement	Residual effect including significance
	Changes in water quality from on-site pollution	Minor adverse, temporary - permanent, irreversible, uncertain	Significant (Local level)	Surface water drainage system (SuDS features)	No significant effect
Common Toad	Disturbance and collision risk	Minor adverse, temporary - permanent, irreversible, uncertain	Significant (Local level)	LEMP (enhancement of retained habitat); and SLS (new habitat creation)	No significant effect
	Changes in water quality from on-site pollution	Minor adverse, temporary - permanent, irreversible, uncertain	Significant (Local level)	Surface water drainage system (SuDS features)	No significant effect
Cumulative Effects					

Ecological Feature	Description of effect	Nature of effect	Significance (pre-mitigation)	Mitigation and enhancement	Residual effect including significance
N/A	None anticipated As long as other development follow the same assessment and mitigation requirements.				No significant effect
Impact of Climate Change					
N/A	Given that the valued habitats and species within the Main Order Limits are widespread and the location of the Proposed Development is not near the edge of any of their ranges; the projected change in temperatures is not anticipated to result in any significant impacts on the designated site, habitat and species.			Maintain and manage green infrastructure	No significant effect

Table 12.6: Mitigation Implementation.

Mitigation Measure	Implementing Agent(s)	Legal Instrument	Compliance Target	Implementation Timescale
Implementation of detailed CEMP and ECMS prior to commencement of ground works and site clearance	Developer of relevant Site phase	DCO requirement	Accord with the aims of the CEMP and ECMS	Agreed prior to commencement of development. Implemented prior to and during construction.
Landscape and Ecological Management Plan	Developer of relevant Site phase	DCO requirement	Deliver the management prescribed within the LEMP	Agreed prior to commencement of development. Implemented post-construction in tandem with landscaping proposals.
Woodland Management Plan	Developer of relevant Site phase, or third party appointee	DCO requirement	No detrimental damage to the woodland habitats through recreational pressure	Agreed prior to commencement of development. Implemented post-construction prior to occupation/operation of development.

Tritax Symmetry (Hinckley) Limited

HINCKLEY NATIONAL RAIL FREIGHT INTERCHANGE

Preliminary Environmental Information Report

Chapter 13: Cultural heritage

January 2022

This document forms a part of a Preliminary Environmental Information Report (PEIR) for the Hinckley National Rail Freight Interchange project.

A PEIR presents environmental information to assist consultees to form an informed view of the likely significant environmental effects of a proposed development and provide feedback.

This PEIR has been prepared by the project promoter, Tritax Symmetry (Hinckley) Limited. The Proposed Development is described in Chapter 3 of the PEIR and is the subject of a public consultation running from 12 January to 9 March 2022.

Details of how to respond to the public consultation are provided at the end of Chapter 1 of the PEIR and on the project website:

http://www.hinckleynrfi.co.uk/

This feedback will be taken into account by Tritax Symmetry (Hinckley) Limited in the preparation of its application for a Development Consent Order for the project.

Chapter thirteen ◆ Cultural Heritage

INTRODUCTION

Introduction

13.1 This chapter sets out a preliminary assessment of the potential effects of the Proposed Development (as described in Chapter 3) on cultural heritage. At this stage, this assessment is preliminary only and is not exhaustive; other effects and mitigation requirements may be identified in light of on-going baseline studies and survey work, stakeholder/public consultation and evolution of the project design. An Environmental Statement (ES) will be submitted with the application for the Proposed Development and this will set out the full assessment.

13.2 Cultural heritage includes a wide range of features recognised in policy as 'heritage assets' resulting from human intervention in the landscape, varying in scope from buried archaeological remains, up to late 20th century industrial structures. In this case, heritage assets include the following:

- World Heritage Sites – An international designation reflecting an asset's 'outstanding universal value';
- Scheduled Monuments – A national designation applied to archaeological sites of 'national importance';
- Listed Buildings (Grades I, II* and II) – A national designation applied to buildings of 'special architectural and historic interest';
- Registered Parks and Gardens (Grades I, II* and II) - A national designation applied to parks and gardens of 'special historic interest';
- Registered Historic Battlefields - A national designation applied to important English battlefields;
- Conservation Areas – Areas designated by the Council as the local planning authority for their 'special architectural and historic interest'; and
- Non-designated heritage assets - Buildings, monuments, sites, places, areas or landscapes identified as having a degree of significance meriting consideration in planning decisions but which are not formally designated heritage assets.

13.3 This chapter describes the methods used to establish baseline conditions currently existing at the Development Consent Order (DCO) Site; the methodology used to determine potential impacts and the mitigation measures required to prevent, reduce or offset

(where possible) any significant adverse impacts and the likely effects after these measures have been implemented.

13.4 This chapter should be read in conjunction with the following PEIR Appendices and other pertinent documents submitted with the DCO application:

- Appendix 13.1 – Archaeological Assessment;
- Appendix 13.2 – Heritage Assessment;
- Appendix 13.3 – Geophysical Survey Report (Phase 1);
- Appendix 13.4 – Geophysical Survey Report (Phase 2);
- Appendix 13.5 – Evaluation Report (Phase 1);
- Figure 13.1 - DCO Site Boundaries and Off-site Junction Locations;
- Figure 13.2 - Designated Heritage Assets and Zone of Theoretical Visibility;
- Figure 13.3 - Historic Built Form within the Main Site Boundary;
- Figure 13.4 - Known Heritage Assets; and
- Figure 13.5 – Extracts from Historic Maps.

METHODOLOGY AND DATA SOURCES

Environmental Impact Assessment (EIA) Scoping Opinion

13.5 An EIA Scoping Opinion was received from the Planning Inspectorate in December 2020 which included comments in relation to the Cultural Heritage Section of the Scoping Report submitted in November 2020. The comments are included in Table 13.1 and Table 13.2 below with an explanation of how each comment has been addressed.

Table 13.1: Planning Inspectorate's Comments from EIA Scoping Opinion in relation to Cultural Heritage (December 2020).

Heritage		
Planning Inspectorate	**Comments**	**Responses**
ID 4.7.2; Ref 12.20-12.37, 12.47	Despite the changes to the red line boundary, this aspect of the Scoping Report focuses on the previous draft Order Limits (scoped in 2018). The ES should apply the same approach and study area, unless otherwise agreed, to the new larger development area (including off-site works). New searches of the Historic Environment Record (HER) and the National Heritage List for England (NHLE) may be required to ensure the most up-to-date and accurate date on the historic environment informs the ES.	The Assessment of the proposed Order Limits has applied the same approach to the study area as previous Data gathering and study areas have been amended accordingly to account for revisions to the DCO boundary taking account of the nature of the Proposed Development including the location of off-site works.
ID 4.7.3	The ES should be undertaken in line with the most up-to-date Historic England (HE) standards and guidance, including (but not limited to): Advice Note 12: Statements of Heritage Significance: • Analysing Significance in Heritage Assets (October 2019); • The Foundation for Success - Modern Infrastructure and the Historic Environment (November 2019); • Piling and Archaeology Guidance and Good Practice (March 2019); and • Preserving Archaeological Remains guidance (first published in November 2016).	Noted and latest guidance has been utilised in the PEIR as appropriate

Heritage		
Planning Inspectorate	**Comments**	**Responses**
ID 4.7.4; Ref 12.46; 12.65 – 12.66	The Scoping Report states that the effects on receptors can be mitigated by a suitable programme of investigation and recording in advance of development. An appropriate archaeological mitigation strategy is also intended be implemented to offset potential effects. All mitigation measures required for the Proposed Development should be fully described and justified and the means by which these will be secured through the DCO should be fully detailed.	Proposed mitigation for archaeological remains will be agreed with the Leicestershire County Council (LCC) Archaeologist and outlined in the assessment, once the suite of archaeological investigations has been completed across the relevant areas of the DCO boundary.
ID: 4.7.5; Ref: 12.47 – 12.64	The Scoping Report refers to agreement reached with HE and the LCC Archaeologist on the methodology. This consultation appears to have covered the Proposed Development main site only. The Applicant should ensure that the assessment methodology for heritage assets (both designated and non-designated) is agreed for the development in its entirety. It should be clear in the ES how consultation has informed the assessment.	The assessment methodology has been agreed with the LCC Heritage Team across the whole of the DCO limits with the exception of the offsite highways which is in the process of being agreed on a case by case basis. The ES will set out how this consultation has informed the assessment.
ID: 4.7.6; Ref: 12.50	The Scoping Report states that additional assets beyond the 5km study area for designated assets will also be assessed as appropriate. It is not clear what criteria would be used to identify additional assets. The inclusion of additional assets should be fully explained in the ES.	The justification for inclusion of any assets beyond the study area will be set out, on a case-by-case basis, in the assessment, as required.

Heritage		
Planning Inspectorate	**Comments**	**Responses**
ID: 4.7.7	The Scoping Report includes figures indicating the location of heritage assets. Photomontages should also be produced for key viewpoints where significant heritage assets are affected, including views towards heritage assets in which the Proposed Development would be visible; views from designated heritage assets; and views between contemporaneous or otherwise associated heritage assets in which both assets and the Proposed Development would be visible.	The locations of photomontages in respect of heritage assets has be agreed with consultees, based on the revised DCO order limits.

Table 13.2: Consultee Comments from EIA Scoping Opinion in relation to Cultural Heritage (December 2020).

Heritage		
Consultee	**Comments**	**Responses**
Burbage Parish Council	CULTURAL HERITAGE As noted above, the applicant has not acknowledged any Cultural significance to Burbage Common. The ES should specifically consider the cultural heritage of the common and associated woods. The Applicant has listed Landscape Designations in the area which does not include Burbage Common. The Applicant states “no Registered Parks and Gardens lie within the 5km search area”. This clearly shows no consideration of Burbage Common has been made.	Burbage Common is not a registered park and garden and it is not identified as a heritage asset at either a local or national level.

Heritage		
Consultee	**Comments**	**Responses**
Elmesthorpe Parish Council	Response notes absence of reference to all listed buildings at Elmesthorpe in scoping report.	The assessment will address all listed buildings within the defined study area, which includes the listed buildings at Elmesthorpe.
Hinckley and Bosworth Borough Council (HBBC)	Chapter 12- Cultural Heritage The section 'Other Planning Policy' correctly identifies the HBBC Local Plan but doesn't specify the relevant policies and spatial objective, which include the following: • Policy DM11: Protecting and Enhancing the Historic Environment; • Policy DM12 Heritage Assets; • Policy DM13 Preserving the Borough's Archaeology; • Core Strategy Spatial Objective 10: Natural Environment and Cultural Assets; and • Core Strategy Spatial Objective 11: Built Environment and Townscape Character.	Noted

Heritage		
Consultee	**Comments**	**Responses**
Historic England (HE)	We note that the Draft DCO Order Limits (Page 36) are different and larger than the area previously consulted on as part of the 2018 Scoping Report. It is important the cultural heritage assessments relate to this current scheme, with the 5km study area based on this redline (or the most up-to-date at the time of the assessment). The same approach should apply to the proposals at M1 Junction 21. New searches of the Historic Environment Record and the National Heritage List for England may be required to ensure the most up-to-date and accurate date on the historic environment informs the EIA. For example, the current redlines suggest more consideration may now need to be given to the settings of the Sapcote Castle and Lubbesthorpe medieval settlement scheduled monuments. Cumulative impact may be an important consideration at Lubbesthorpe. Similarly, the historic landscape, inter-visibility and interconnection between the historic settlements (and heritage assets) at Sapcote, Aston Flamville and Sharnford may need more thought than would have been needed with the DCO Order Limits noted in the 2018 scoping report.	The Assessment of the revised DCO will apply the same approach to the study area as previous 2018 scope and ensure data gathering and study areas are amended to reflect the revised DCO order limits and those assets that have the potential to be affected by the Proposed Development within the DCO boundaries.
Leicestershire County Council	CULTURAL HERITAGE Table 12.1, Point 3: The site boundary has been extended with the inclusion of the Off-Site Highways Works, it does not appear that the developer has attempted to update the heritage baseline data in respect of this extended area. We would expect this includes both designated and non-designated heritage assets, as well as other heritage assets, such as ridge and furrow earthworks and historic landscape character areas.	The Assessment of the revised DCO will ensure data gathering and study areas are amended to reflect the revised DCO order limits.

Heritage		
Consultee	**Comments**	**Responses**
	Table 12.1, Point 5: It is unclear how the concerns raised by the Planning Inspector, in respect of HE's comments (engaging with the significance of Heritage Assets) are to be addressed.	As requested by HE, the assessment will include a proportionate narrative in respect of the significance of heritage assets affected and not rely solely on a tabular matrix.
	Para. 12.23: In respect of designated HAs, see above Table 12.1, Point 3.	Noted
	Para. 12.31: As above.	Noted
	Para. 12.35: Two discrete areas of archaeological potential, comprising a ring ditch (and associated features/finds) immediately west of Hobbs Hays Farm and a separate Roman settlement site located to the north of Aston Firs/Elmesthorpe Plantation.	Noted
	Para. 12.50: What criteria will be used to identify additional assets outside the 5km study area for designated heritage assets? The same/similar criteria should be used to include consideration of non-designated heritage assets outside the respective 1km study area.	Any assets beyond the study area identified by consultees to require assessment
	Para. 12.65: As above (Table 12.1, Point 3).	Noted
	Para 12.70: The assessment of the low sensitivity of heritage assets identified to date is premature. In the absence of submission of the results of the completed surveys, it would be safer to assume that evaluation of the Main Site has revealed remains of low to medium sensitivity. It should also be recognised that this level of sensitivity cannot be assumed for the area as yet unevaluated, specifically those areas affected by the off-site highways works.	Noted

Assessment Methodology and Significance Criteria

Relevant Policy and Guidance

13.6 The assessment of cultural heritage assets has been conducted in line with the latest and most comprehensive guidance provided in:

- The National Policy Statement (NPS) for National Networks (2014);
- National Planning Policy Framework (NPPF) (2021) Section 16 Conserving and enhancing the historic environment;
- The Design Manual for Roads and Bridges (DMRB) Volume 11, Section 3, Part 2 (LA104: Environmental assessment and monitoring) published by Highways England in 2020;
- Conservation Principles, Policies and Guidance published by English Heritage 2008;
- Annex 1 of 'Scheduled Monuments: Identifying, protecting, conserving and investigating nationally important archaeological sites under the Ancient Monuments and Archaeological Areas Act 1979' that sets out a series of criteria against which the national importance, or otherwise, of any recorded archaeological remains can be judged;
- Historic Environment Good Practice Advice in Planning Note 2: Managing Significance in Decision-Taking in the Historic Environment: Historic England Guidance published 2015;
- Historic Environment Good Practice Advice in Planning Note 3: The Setting of Heritage Assets: Historic England Guidance published 2017;
- Historic England Advice Note 12: Statements of Heritage Significance: Analysing Significance in Heritage Assets (October 2019);
- Historic England's 'Heritage: The Foundation for Success - Modern Infrastructure and the Historic Environment' (November 2019);
- Historic England's 'Piling and Archaeology Guidance and Good Practice' (March 2019); and
- Historic England's 'Preserving Archaeological Remains: Decision-taking for Sites under Development' (November 2016).

13.7 These documents do not provide a prescriptive approach to assessment, but identify principles and good practice that have been applied in the methodology for this assessment.

Assessment Methodology

13.8 A series of baseline studies have been completed to inform the preparation of this chapter. These were undertaken in accordance with the relevant guidance set out above, as well as the body of 'Standard and Guidance' produced by the Chartered Institute for Archaeologists (CIfA), and comprise:

- An Archaeological Assessment (Appendix 13.1), that comprised examination and assessment of available archaeological and historical information (including the Leicestershire HER) in order to clarify the archaeological potential of the DCO Site, and which incorporated the results of a walkover survey assessing the archaeological and built form within the Main HNRFI Site as well as the results of a geophysical survey and archaeological trial trench evaluation on the Main HNRFI Site and A47 Link Road within the Main Order Limits;

- A Heritage Assessment (Appendix 13.2) including visits to all relevant designated heritage assets within the study area;

- Two programmes of geophysical survey comprising detailed gradiometer survey (magnetometry) undertaken over the Main HNRFI Site and A47 Link Road within the Main Order Limits (Appendix 13.3 and Appendix 13.4); and

- The results of a programme of archaeological evaluation trenching undertaken over the Main HNRFI Site (Appendix 13.5).

Significance of Effect

13.9 In line with the National Networks NPS, and other industry standard best-practice guidance (as set out above), the assessment first identifies the heritage significance of relevant assets through a proportionate narrative analysis, and thereafter assesses the impact of the proposed development on that significance. Impacts are not harmful unless they adversely affect a heritage asset's significance.

13.10 Having established the significance of heritage assets, and those that are sensitive to change resulting from the Proposed Development, Tables 13.3, 13.4 and 13.5 set out the criteria that is then employed in attributing 'sensitivity' to archaeological and heritage assets, identifying the magnitude of any changes to them (i.e. the impact) and assessing the significance of the resulting effects in EIA terms.

13.11 The sensitivity of the heritage assets identified is assessed on the basis of Table 13.3. The magnitude and significance of potential effects on archaeological remains and built heritage resources, arising from the implementation of the Proposed Development, will be identified and appropriately assessed, based on Tables 13.4 and 13.5.

13.12 The significance of effect is assessed with reference to the receptor's (i.e., the heritage asset's) sensitivity and the magnitude of impact.

13.13 The criteria in Table 13.4 are based on criteria established by Highways England in its Design Manual for Roads and Bridges (2020). This is an industry standard assessment methodology, and the only one adopted by a government agency.

13.14 The attribution of the sensitivity of a heritage asset is a question of professional judgement derived from an assessment its heritage significance. However, in order to bring a degree of objective, procedural rigor into what otherwise might be judged to be 'personal opinion', the sensitivity of the receptor (heritage asset) is defined by its importance in terms of national, regional or local statutory or non-statutory protection and grading of the asset. The non-statutory criteria used by the Secretary of State for scheduled monuments provide relevant criteria to assist this process, as do the HE Listing Selection Guides and the Department for Digital, Culture, Media and Sport (DCMS) Principles of Selection for Listing Buildings document. Table 13.3 below sets out the criteria for assessing sensitivity.

Table 13.3: Sensitivity of Receptor.

Receptor	**Sensitivity of receptor**				
	Very High	High	Medium	Low	Negligible
World Heritage Site					
Scheduled Monument					
Grade I or II* listed building					
Grade I or II* registered park or garden					
Other nationally important archaeological asset					
Grade II listed building					

	Sensitivity of receptor				
Grade II registered park or garden					
Conservation area					
Other asset of regional or county importance					
Locally important asset with cultural or educational value					
Heritage site or feature with very limited value or interest					

13.15 The classification of the magnitude of change to heritage assets is rigorous and based on consistent criteria. This will take account of such factors as the physical scale and type of disturbance to them and whether features or evidence would be lost that are fundamental to their heritage interest and therefore significance. The magnitude of change is assessed using the criteria in Table 13.4.

Table 13.4 Magnitude of Change

Magnitude of Change				
Large	**Medium**	**Small**	**Negligible**	**None**
Change to the significance of a heritage asset so that it is completely altered or destroyed				

Magnitude of Change				
Large	**Medium**	**Small**	**Negligible**	**None**
	Change to the significance of a heritage asset so that it is significantly modified			
		Change to the significance of a heritage asset so that it is noticeably different		
			Change to the significance of a heritage asset that hardly affects it	
				No change to the significance of an asset

13.16 Following the evaluation of sensitivity for specific archaeology and cultural heritage receptors and the magnitude of impact, the significance of effect is assessed using the criteria shown in Table 13.5.

Table 13.5 Significance matrix

Magnitude of change	Sensitivity of receptor				
	Very High	**High**	**Medium**	**Low**	**Negligible**
Large	Severe	Major	Moderate	Moderate or Minor	Minor
Medium	Major	Major or Moderate	Moderate or Minor	Minor	Negligible
Small	Moderate	Moderate or Minor	Minor	Negligible	Neutral
Negligible	Moderate or Minor	Minor	Negligible	Neutral	Neutral
None	Neutral	Neutral	Neutral	Neutral	Neutral

13.17 The assessment matrix defined in Table 13.6 is not intended to be 'prescriptive', but rather it allows for the employment of professional judgement to determine the most appropriate level of effect for each heritage asset that is identified.

13.18 Effects will be categorised with regard to their nature (adverse, beneficial or neutral) and their permanence (permanent, temporary or reversible). For all forms of heritage asset (receptor); including archaeological sites and remains, historic buildings, places and areas; and historic landscapes; the sensitivity of the receptor will be combined with the predicted magnitude of change to heritage significance to arrive at the significance of effect in EIA terms.

13.19 The combination of sensitivity and magnitude of change is undertaken with reference to the matrix in Table 13.6, with those effects defined as severe or major being deemed 'significant'. All other effects are determined to be 'not significant' in EIA terms.

Cumulative Effects

13.1 Cumulative effects generally occur where there might be simultaneous or sequential effects on heritage assets of two or more developments of the same type and scale, or where the consideration of other schemes would increase an effect identified. Where other similar schemes are in the planning system and made known to the Applicant, or are under construction, these are considered in conjunction with the Proposed Development. PINS Advice Note 17: Cumulative effects assessment relevant to nationally significant infrastructure projects (PINS, 2015c) will be taken into account in identifying cumulative schemes.

13.2 Those cumulative development sites within the near vicinity of the Proposed Development (see Figure 20.1), which have the potential to result in cumulative effects on heritage assets, will be assessed against the likely effects of the Proposed Development to determine whether cumulative effects are likely and if so their significance. This will be reported in the ES.

Surveys

13.3 The baseline assessments commenced with data trawls in 2017, consistently updated into 2021, with field assessment of the DCO Site and heritage assets in the study area undertaken by experienced heritage consultants over a series of surveys between 2018 and 2021. The programme of geophysical survey and trial trench evaluation of the Main HNRFI Site and A47 Link Road within the Main Order Limits was undertaken in a series of phases, from April 2018 to December 2021. The trial trench evaluation of the A47 Link Road is due for completion in early 2022.

Study Areas

13.4 As a result of baseline analysis, together with an understanding of the nature and scale of the development, and the likely extent and distribution of effects on heritage assets, the assessment defines the following study areas, as represented on Figures 13.2 and 13.4:

- Study area for assessment of designated heritage assets – set at 5km distance from the Main HNRFI Site, A47 Link Road and M69 J2 works (as requested by Historic England); and

- Study area to inform assessment of archaeological potential – set at 1km from the Main HNRFI Site and A47 Link Road and M69 J2 works (as agreed with the LCC Archaeologist).

13.5 Following initial analysis and subsequent field work informed by the results of the Landscape and Visual Assessment (Chapter 11), and having an appreciation of the parameters of the Proposed Development within the Main HNRFI Site, A47 Link Road and M69 J2 within the Main Order Limits, it should be acknowledged that, despite the 5km study area for consideration of the setting of designated heritage assets, it is expected that heritage assets, in common with landscape areas and features, are likely to be affected

only within a 2km radius of the Main HNRFI Site.

13.6 With regard to the associated highway and railway works within the DCO Site beyond the Main HNRFI Site,A47 Link Road and M69 J2, given the limited nature of many components of the intended works and the pre-existing transport character purpose they occupy (i.e. existing roads, signs, railway infrastructure etc), these have been considered on a case-by-case basis in terms of their potential for significant adverse effects on Cultural Heritage receptors, rather than adopting the wide-ranging study areas that have been applied to the Main HNRFI Site.

Limitations and Assumptions

13.7 No specific assumptions have been made in the preparation of this assessment, and neither are there any intrinsic limitations to the conclusions reached.

13.8 Baseline conditions have been established using existing assessments, available documentation and field assessment; it is important to note that this information may change before or during the construction and operation of the proposed development.

13.9 It should be recognised that much of the data acquired and used in preparation of the baseline appendices, and this chapter, has been supplied by public bodies, and must therefore be assumed to be accurate and robust.

13.10 Within reasonable limits, the assessment is undertaken in consideration of the 'worst case' scenario for the Proposed Development i.e. those potential outcomes, situations or locations which would result in the most profound effect on cultural heritage receptors. It therefore identifies the greatest degree of change likely to accrue and may be subject to mitigating factors or alternative conditions which might reduce those effects.

13.11 The assessment applies a pre-determined methodology to arrive at conclusions (as outlined above). This procedure brings a degree of objective, procedural rigour into what otherwise might be judged to be 'personal opinion'. Certainly, professional judgement still plays its part, but the purpose of adopting the industry best-practice methodology is to make the process as clear and logical as possible.

13.12 In common with Chapter 11 addressing Landscape and Visual Effects, this chapter of the PEIR identifies and assesses, in some instances, the nature and magnitude of potential effects arising from the Proposed Development in respect of views of or from heritage assets. However, whilst the consideration of these receptors may be common to both chapters, the methodologies employed in the identification and assessment of potentially significant effects upon them are not. As a consequence, whilst the two chapters should be read in conjunction, the conclusions reached in respect of the proposed development's impact in consideration of effects in association with designated heritage assets such as listed buildings, conservation areas and scheduled monuments (and potentially other forms of heritage asset), will not necessarily be the same, and should not be assumed to be so.

13.13 It should also be recognised that mere inter-visibility is not the sole or even prime consideration when assessing the potential indirect effect of development proposals on heritage assets.

RELEVANT LAW, POLICY AND GUIDANCE

Legislative and Policy Context

13.14 Sections 66(1) and 72(1) of the Planning (Listed Buildings and Conservation Areas) Act 1990 set out the duties of Local Planning Authorities (LPA) in respect of the treatment of listed buildings and conservation areas through the planning process.

13.15 Section 66(1) of the Act sets out the statutory duty of the decision-maker, where proposed development would affect a listed building or its setting.

13.16 Section 72(1) of the 1990 Act states that: '*In the exercise, with respect to any buildings or other land in a conservation area…special attention shall be paid to the desirability of preserving or enhancing the character or appearance of that area'.*

13.17 This 'special regard' or 'special attention' duty has been tested in the Court of Appeal and confirmed to require that '*considerable importance and weight*' should be afforded by the decision maker to the desirability of preserving a listed building along with its setting, or the character or appearance of a conservation area. The relevant Court judgement is referenced as Barnwell Manor Wind Energy Ltd v East Northants DC English Heritage and National Trust (2014) EWCA Civ 137.

13.18 The relevant legislation concerning the treatment of scheduled monuments is the Ancient Monuments and Archaeological Areas Act 1979 (HMSO 1979). This Act details the designation, care, and management of scheduled monuments, as well as detailing the procedures needed to obtain permission for works which would directly impact upon their preservation. The act does not confer any statutory protection on the setting of scheduled monuments.

13.19 Policy Framework

National Policy Statement for National Networks (2014)

13.20 The NPS for National Networks sets out the need for and the government's policies to deliver development of Nationally Significant Infrastructure Projects (NSIPs) on the national road and rail networks in England and Wales. It provides planning guidance for promoters of NSIPs on the road and rail networks, and the basis for the examination by the Examining Authority and decisions by the Secretary of State.

13.21 The NPS recognises the need to consider heritage assets within the application and determination process as the construction and operation of national infrastructure has the potential to result in adverse impacts on the historic environment, as stated in

paragraph 5.120. The historic environment section of the statement (NPS pp. 71-75) emphasises the need for local authorities to set out a clear strategy for the conservation and enjoyment of the historic environment, where heritage assets are recognised as a finite and irreplaceable resource, to be preserved in a manner appropriate to their significance.

13.22 Paragraph 5.127 addresses applications for NSIPs, stating that:

'The applicant should describe the significance of any heritage assets affected, including any contribution made by their setting. The level of detail should be proportionate to the asset's importance and no more than is sufficient to understand the potential impact of the proposal on their significance. As a minimum the relevant Historic Environment Record should have been consulted and the heritage assets assessed using appropriate expertise. Where a site on which development is proposed includes or has the potential to include heritage assets with archaeological interest, the applicant should include an appropriate desk-based assessment and, where necessary, a field evaluation.'

13.23 Designated heritage assets are addressed in Paragraph 5.131, which states that:

'When considering the impact of a proposed development on the significance of a designated heritage asset, the Secretary of State should give great weight to the asset's conservation. The more important the asset, the greater the weight should be. Once lost, heritage assets cannot be replaced and their loss has a cultural, environmental, economic and social impact. Significance can be harmed or lost through alteration or destruction of the heritage asset or development within its setting. Given that heritage assets are irreplaceable, harm or loss affecting any designated heritage asset should require clear and convincing justification. Substantial harm to or loss of a grade II Listed Building or a grade II Registered Park or Garden should be exceptional. Substantial harm to or loss of designated assets of the highest significance, including World Heritage Sites, Scheduled Monuments, grade I and II Listed Buildings, Registered Battlefields, and grade I and II* Registered Parks and Gardens should be wholly exceptional.'*

13.24 With regard to non-designated heritage assets, Paragraph 5.125 states that:

'The Secretary of State should also consider the impacts on other non-designated heritage assets (as identified either through the development plan process by local authorities, including 'local listing', or through the nationally significant infrastructure project examination and decision making process) on the basis of clear evidence that the assets have a significance that merit consideration in that process, even though those assets are of lesser value than designated heritage assets.'

Planning Policy

13.25 The NPPF sets out the government's approach to the conservation and management of the historic environment, including both listed buildings and conservation areas, through the planning process in more general terms. The opening paragraphs of Section 16 [189 and 190] emphasise the need for local authorities to set out a clear strategy for the

conservation and enjoyment of the historic environment, where heritage assets are recognised as an irreplaceable resource, to be conserved in a manner appropriate to their significance.

Local Planning Policy

13.26 The DCO Order Limits fall across two LPA areas: Blaby District and Hinckley and Bosworth Borough. The relevant adopted local statutory planning documents include:

- Blaby District Local Plan (Core Strategy) (adopted 2013);
- Blaby District Local Plan (Delivery) Development Plan Document (adopted 2019);
- Hinckley and Bosworth Borough Core Strategy (adopted 2009); and
- Hinckley and Bosworth Borough Site Allocations and Development Management Policies (adopted 2016);

Blaby District Local Plan (Core Strategy) (adopted February 2013)

13.27 The Blaby District Local Plan 2013-2029 (Core Strategy) provides the strategic planning policy framework and sets out strategic site allocations for the District to 2029. The Core Strategy forms part of the spatial plan and provides the basis for decisions on land use planning affecting Blaby District.

13.28 Policy contained within the adopted Local Plan, relevant to the historic environment, includes:

'Policy CS20: Historic Environment and Culture

Blaby District has a number of important buildings, sites and areas of historic value including Scheduled Monuments (SMs), Listed Buildings, Conservation Areas, archaeological remains and other heritage assets. These (including heritage assets most at risk through neglect, decay or other threats) will be preserved, protected and where possible enhanced.

The Council takes a positive approach to the conservation of heritage assets and the wider historic environment through:

a) Considering proposals for development on, in, or adjacent to historic sites, areas and buildings against the need to ensure the protection and enhancement of the heritage asset and its setting. Proposed development should avoid harm to the significance of historic sites, buildings or areas, including their setting;

b) Expecting new development to make a positive contribution to the character and distinctiveness of the local area;

c) Ensuring that development in Conservation Areas is consistent with the identified special character of those areas, as well as working, where appropriate, to identify other areas of special architectural merit or historic interest in designating additional Conservation Areas;

d) Securing the viable and sustainable future of heritage assets through uses that are consistent with the heritage asset and its conservation; and

e) Promoting heritage assets in the District as tourism opportunities where appropriate.'

13.29 In addition to policy CS20, Paragraphs 7.20.1 to 7.20.4 of the Local Plan make the following points:

'The East Midlands Regional Plan indicates that 'the historic environment should be understood, conserved and enhanced' in order to 'contribute to the Region's quality of life'. The above policy aims to meet this objective by protecting (and where possible enhancing) archaeological sites, historic buildings, conservation areas, historic parks and other cultural assets.

The National Planning Policy Framework (NPPF) emphasises the importance of Local Plans setting out a positive strategy for the conservation and enjoyment of the historic environment and its heritage assets, and places a heavy emphasis on the conservation of heritage assets in a manner appropriate to their significance.

Blaby District contains a number of important archaeological sites (including 14 Scheduled Monuments). In addition there are numerous areas of known archaeological interest and the potential for other unexplored areas to contain important archaeological artefacts.

The District of Blaby has nine conservation areas and some 200 listed buildings. Development proposals that affect listed buildings or fall within Conservation areas need to be of very high design quality taking into consideration the principles of good design set out in Policy CS2.'

Blaby District Local Plan (Delivery) Development Plan Document (adopted 2019)

13.30 The Blaby District Local Plan (Delivery) Development Plan Document contains the development management policies that apply across the District, with the following of relevance to cultural heritage:

'DEVELOPMENT MANAGEMENT POLICY 12

Designated and Non-designated Heritage Assets

All new development should seek to avoid harm to the heritage assets of the District. Development proposals that conserve or enhance the historic environment will be supported.

All proposals affecting either a designated or non-designated heritage asset and/or its setting will need to submit a statement which includes the following:

- *a description of the heritage asset and its setting, proportionate to its significance;*
- *a clear identification of the impacts of the development proposal on the heritage asset and its setting;*
- *a clear justification as to why the impacts could be considered acceptable; and*
- *demonstrate how the proposal is consistent with Core Strategy Policy CS20.*

The Council will consider the submitted information having regard to the importance of the heritage asset(s) as follows:

Designated heritage assets

Designated heritage assets and their settings (including Listed Buildings, Scheduled Monuments and Conservation Areas) will be given the highest level of protection to ensure that they are conserved and enhanced in a manner appropriate to their significance and contribution to the historic environment.

Where substantial harm is identified, proposals will only be supported in exceptional circumstances in accordance with national planning guidance. Where a less than substantial level of harm is identified the scale of harm will be weighed against the public benefits of the proposal.

Non-designated heritage assets

A balanced consideration will be applied to proposals which may impact non-designated heritage assets. Proposals will be supported where the benefits of the scheme are considered to outweigh the scale of any harm or loss, having regard to the significance of the heritage asset.'

Hinckley and Bosworth Borough Core Strategy (adopted 2009)

13.31 The Hinckley and Bosworth Borough Core Strategy (adopted 2009) contains the following spatial objectives of relevance to cultural heritage:

'Spatial Objective 10: Natural Environment and Cultural Assets To deliver a linked network of green infrastructure, enhancing and protecting the borough's distinctive landscapes, woodlands, geology, archaeological heritage and biodiversity and encourage its understanding, appreciation, maintenance and development.

Spatial Objective 11: Built Environment and Townscape Character To safeguard, enhance and where necessary regenerate the borough's distinctive built environment including its wider setting particularly that associated with Conservation Areas, Listed Buildings and historic industries.'

Hinckley and Bosworth Borough Site Allocations and Development Management Policies (adopted 2016)

13.32 The Hinckley and Bosworth Borough Site Allocations and Development Management Policies) contains the development management policies that apply across the Borough, with the following of relevance to cultural heritage:

'DM11 Protecting and Enhancing the Historic Environment

The Borough Council will protect, conserve and enhance the historic environment throughout the borough. This will be done through the careful management of development that might adversely impact both designated and non-designated heritage assets. All development proposals which have the potential to affect a heritage asset or its setting will be required to demonstrate: setting; and a) An understanding of the significance of the heritage asset and its b) The impact of the proposal on the significance of the asset and its setting, including measures to minimise or avoid these impacts; c) How the benefits of the proposal will outweigh any harm caused; and d) Any impact on archaeology in line with Policy DM13.'

'DM12 Heritage Assets

All development proposals affecting heritage assets and their setting will be expected to secure their continued protection or enhancement, contribute to the distinctiveness of the areas in which they are located and contribute to the wider vibrancy of the borough.

All development proposals affecting the significance of heritage assets and their setting will be assessed in accordance with Policy DM11: Protecting and Enhancing the Historic Environment and will require justification as set out in this policy.

All development proposals will need to accord with Policy DM10: Development and Design.

Listed Buildings

Proposals for the change of use, extensions and alterations of listed buildings and development affecting the setting of listed buildings will only be permitted where it is demonstrated that the proposals are compatible with the significance of the building and its setting.

Conservation Areas

Development proposals should ensure the significance of a conservation area is preserved and enhanced through the consideration and inclusion of important features (as identified in the Conservation Area Appraisal and Management Plan) including, but not limited to the following: materials which are characteristic of the conservation area; and out of the Conservation Area; with those of the same or similar species;

a) Appropriate boundary treatments which reflect the local style;

b) The preservation and enhancement of key views and/or vistas in;

c) The replacement of dead or dying important trees and hedgerows;

d) Reinforce or mirror the historic street pattern and plan form where feasible;

e) The use of sensitively styled street furniture;

f) The use of natural building materials, preferably locally sourced; and

g) The retention of key spaces within the conservation area.

Proposals which seek to improve identified neutral and negative areas inside designated conservation areas, which also lead to the overall enhancement of the conservation area, will be supported and encouraged.

All applications which include the demolition of buildings and means of enclosure within a Conservation Area must propose an adequate replacement which enhances the character and appearance of the conservation area. Conditions will be imposed to ensure demolition does not occur until immediately prior to the redevelopment or remediation.

Historic Landscapes

Proposals affecting historic landscapes, their features or setting should have regard to their significance and be justified in line with Policy DM11.

Development proposals within or adjacent to the historic landscape of Bosworth Battlefield should seek to better reveal the historic significance of the area.

Proposals which adversely affect the Bosworth Battlefield or its setting should be wholly exceptional and accompanied by clear and convincing justification. Such proposals will be assessed against their public benefits.

Particular regard will be had to maintaining topographical features, archaeological remains or to the potential expansion of the Battlefield.

Proposals which seek to enhance the educational or tourism provision associated with the Bosworth Battlefield will be encouraged where they comply with other policies in the Local Plan.

Scheduled Monuments

Proposals which adversely affect a scheduled monument or its setting should be wholly exceptional and accompanied by clear and convincing justification.

Locally Important Heritage Assets

Assets identified on the Locally Important Heritage Asset List should be retained and enhanced wherever possible. The significance of the assets illustrated in the List and the impact on this significance should be demonstrated and justified in line with Policy DM11.'

DM13 Preserving the Borough's Archaeology

Where a proposal has the potential to impact a site of archaeological interest, developers should set out in their application an appropriate desk-based assessment and, where applicable, the results of a field evaluation detailing the significance of any affected asset.

Where applicable, justified and feasible the local planning authority will require remains to be preserved in situ ensuring appropriate design, layout, ground levels, foundations and site work methods to avoid any adverse impacts on the remains.

Where preservation of archaeological remains in situ is not feasible and/or justified the local planning authority will require full archaeological investigation and recording by an approved archaeological organisation before development commences.'

13.33 A single off-site junction within the DCO Site is also located on the boundary of Harborough District and Rugby Borough. Therefore, this PEIR has had regard to the relevant adopted historic environment policy within these LPA's, which includes Policy HC1 of the Harborough Local Plan 2011-2031 and Policy SDC3 of the Rugby Borough Council Local Plan 2011-2031.

13.34 A detailed review of planning policy will be undertaken within the Planning Statement accompanying the DCO application.

CONSULTATIONS

13.35 In addition to the consultation responses received in the Scoping Opinion, the assessment has been informed by further consultation with the LCC Principal Archaeologist to confirm an appropriate strategy to provide a robust assessment of the archaeology of the main HNRFI Site and A47 Link Road. Consultation established the requirement for a programme of geophysical survey and a trial trench evaluation across the main HNRFI Site and including the extents of the A47 Link Road and M69 J2 works. The results of these surveys are included in Technical Appendices 13.3 - 5. Trial trenching across the extents of the A47 Link Road is yet to be completed.

13.36 Consultation was also undertaken with the HBBC Senior Planning Officer (Conservation and GIS), and the LCC Conservation Officer (conservation advisor to Blaby District Council) in August 2017 in order to agree the study area and methodology for the assessment of the setting of designated heritage assets, which conform with those study areas identified in the subsequent scoping opinion.

13.37 The assessment has also been informed by consultation with the Hinckley and Bosworth Borough Council (HBBC) Planning Officer, LCC Landscape Architect (advisor to Blaby District Council) and LCC Heritage Team Manager in January 2021 in order to agree the photoviewpoint selections, including those in respect of relevant heritage assets in the study area.

13.38 Comments received from the Pre-Application Community Consultation in 2018 and Highways Consultation in 2019 have also been considered in the production of this PEIR. A limited number of concerns were raised during these consultation exercises in respect of the impact of the Proposed Development on Cultural Heritage, in general terms highlighting the potential for impacts on heritage assets within and around the DCO Site. Accordingly, it is considered that these potential impacts are fully addressed in the PEIR.

BASELINE CONDITIONS

13.39 A general description of the DCO Site and surroundings is provided in Chapter 2: S*ite Description* of this PEIR.

13.40 This section identifies the relevant archaeology and cultural heritage receptors (heritage assets) within the extents of the DCO Site and its wider zone of influence. It draws upon the results of the supporting baseline assessment and investigative fieldwork reports (Technical Appendices 13.1 to 13.5), which address the Main HNRFI site well as the locations of the off-site highways, railway and junction works.

13.41 A detailed description of the baseline situation at and around the DCO Site is set out in Technical Appendix 13.1 and 13.2. Provided below is a summary of the baseline assessment with regard to cultural heritage, with the relevant receptors identified on supporting Figures 13.1 to 13.4.

Designated Heritage Assets

13.42 There are 13 scheduled monuments, two Grade I, 11 Grade II*, 128 Grade II listed buildings and ten Conservation Areas located within the 5km study area defined around the Main HNRFI Site. Detailed assessment set out in Technical Appendix 13.2 has identified that the majority of these assets have no potential to be affected by the Proposed Development due to a lack of any visual or functional association with it. Where the Proposed Development has the potential to result in effects to designated heritage assets, they are considered further below.

13.43 No designated heritage assets are located within the DCO Site. However, the baseline assessment in Technical Appendix 13.2 identifies a single scheduled monument, seven listed buildings, and a single conservation area that, although not actually situated within the DCO Site, could potentially experience a change to their wider 'settings' as a result of the proposed development in the Main HNRFI Site and A47 Link Road specifically, that might affect their heritage significance, or the appreciation of that significance. These assets are summarised below.

13.44 In consideration of the areas of the DCO Site beyond the Main HNRFI Site and A47 Link Road and their relationship to designated heritage assets, including the off-site highway and junctions and railway works, the changes within these areas are so limited; involving in the case of the off-site highways and junctions only additional signage, occasional road

calming measures and minor adjustments to the existing highway network and for the land south of the A47 Link the conversion of the agricultural fields to a planted county park extension; that there is considered to be no potential for any designated heritage assets in the study area to experience a change to their wider 'settings' that might affect their heritage significance, or the appreciation of that significance as a result of works within the DCO Site beyond the Main HNRFI Site and A47 Link Road.

13.45 As such the following assets are assessed in respect of the consideration of the potential effects of the Proposed Development within the Main HNRFI site.

Elmesthorpe Church, Ruined Nave and West Tower Scheduled Monument (1005076), Elmesthorpe

13.46 The Elmesthorpe Church scheduled monument comprises a 13th century ruined nave and west tower, adjoined to the Grade II Listed Church of St Mary. The scheduled monument and attached church are located on rising ground in the linear settlement of Elmesthorpe.

13.47 The ruins date to the 13th century, with the rest of the church having been altered from the 14th century onwards. The significance of this monument is primarily derived from its considerable archaeological interest, although the ruins of the church also possess a high degree of historic and architectural interest.

13.48 In terms of its setting, the monument is situated within the graveyard associated with the attached Church of St Mary, which provides an understanding of the historic context of the ruins. The church is set back, but highly visible, from the adjacent road to the south, which affords the most common experience of the asset. From the grounds of the ruined church there are wide views south over the modern developments in the settlement, towards the lower-lying land that formed the church's historic parish. These views also afford glimpses of the spire of the Church of St Catherine in Burbage.

13.49 In these views from the church there is an appreciation of the north-western portions of the Main HNRFI Site, which also have an historical functional association, having formed part of the Elmesthorpe parish associated with the church, albeit making only a very limited contribution to the significance of the asset through this association (Photoviewpoint and Photomontage 19).

13.50 Furthermore, although the ruined church is not widely visible from the wider landscape, being located nestled into a south facing slope, the monument can be glimpsed from northern parts of the Main HNRFI Site.

13.51 The Elmesthorpe Church scheduled monument is considered to be a sensitive receptor, due to the potential for development in the Main HNRFI Site to affect the appreciation of the church from the wider landscape and erode its historically associated wider agricultural setting.

13.52 The Elmesthorpe Church is deemed to be of high sensitivity based on the criteria for scheduled monuments as set out in Table 13.3.

Grade II listed Wentworth Arms and Adjoining Stables (1307251), Elmesthorpe

13.53 The Grade II listed Wentworth Arms and Adjoining Stables (1307251) are located adjacent to the eastern area of the Main HNRFI Site, which will form the secondary access road. The building was built in 1896 to the designs of C F A Voysey for Lord Lovelace of Kirkby Mallory, as with Wortley Cottages. The pub is a single storey brick building built alongside the road. The significance of the building is primarily derived from the historic and architectural interest of its built form.

13.54 In terms of its setting, the listed building was originally constructed as part of a contemporary development around the station, which included the Wortley Cottages to the north of the railway. It is likely that the pub was specifically built to serve passing trade associated with users of the road and railway. These functional associations with the highway and railway, as well as the cottages, make a contribution to the significance of the listed building. The building's prominent roadside location also contributes to the significance of the asset and allows the key view of the building, from where it was principally intended to be appreciated.

13.55 Although the asset is close to the Main HNRFI Site, this area of the site will be a secondary access road, and as such will undergo limited change to the highway itself. Nonetheless, there is the potential that the Proposed Development might lead to change to the immediate setting of the building, and specifically the adjacent highway.

13.56 More widely, the land within the Main HNRFI Site is not considered to make any contribution to the heritage interest of this listed building, and there are no known historic functional associations between the listed building and the wider farmland located beyond.

13.57 Even so, the Wentworth Arms and Adjoining Stables is considered to be a sensitive receptor, due to the potential for development in the Main HNRFI Site to affect the experience of the asset and its roadside setting.

13.58 The Wentworth Arms and Adjoining Stables are deemed to be of high sensitivity based on the criteria for listed buildings as set out in Table 13.3.

Grade I Church of St Mary (1074229), Barwell

13.59 To the north of the Main HNRFI Site, the Grade I Church of St Mary (1074229) is located on the southern edge of Barwell, on the ridge of high ground c.1.8km north-west of the Main HNRFI Site.

13.60 The church dates to the 13th-14th century and was extensively restored in the 19th century. It is built of random rubblestone with freestone dressings and a 3-stage west tower. The significance of the church is primarily derived from the exceptional historic, architectural and artistic interest of its built form, which also has value due to its archaeological interest.

13.61 In terms of its setting, the church is located within its walled churchyard containing a raised

graveyard. It is situated on the edge of the historic core of the settlement of Barwell, which was formally a small linear village based around the current high street. However, the church is set away from the main high street and is now almost entirely surrounded by late 20th century residential development, such that the relationship between the church and the historic core of the settlement is difficult to appreciate from the church.

13.62 More widely, there are glimpsed views from the southeast edge of the churchyard over the lower-lying land to the south (Photoviewpoint and Photomontage 25). Although not key to the appreciation of the significance of the asset, these views from this limited part of the churchyard allow an appreciation of the wider landscape setting of the church. The spires of the Church of All Saints in Sapcote (1177924) and the Church of St Michael in Stoney Stanton (1074704) can also be glimpsed in the distance, albeit they do not form prominent skyline features.

13.63 In these views from the church there is an experience of parts of the Main HNRFI Site, in the context of the wider expanse of low-lying land, although there is no apparent functional connection between the church and the Main HNRFI Site.

13.64 The church is visible from many areas within and outside Barwell, and as such it is experienced in a wider landscape context as a focal point and landmark of the settlement.

13.65 Due to the church's location on the higher ground to the north, there are some glimpsed views available of the tower from parts of the Main HNRFI Site.

13.66 The Church of St Mary (1074229) at Barwell is considered to be a sensitive receptor, due to the potential for development in the Main HNRFI Site to affect the appreciation of the church from the wider landscape and erode its historical wider agricultural setting in views from the churchyard.

13.67 The Church of St Mary at Barwell is deemed to be of high sensitivity based on the criteria for listed buildings as set out in Table 13.3.

Grade II Church of St Mary (1074693), Elmesthorpe

13.68 The Grade II Church of St Mary (1074693) is located circa 1km north of the Main HNRFI Site within the settlement of Elmesthorpe. The church is directly associated with the scheduled remains of the medieval tower and nave (see above). The church itself has 14th century origins, though was rebuilt in 1868 in random granite rubble and dressed stone.

13.69 It is this historic and architectural interest which mainly contributes to the significance of this asset, along with its association with the attached church ruins.

13.70 In terms of its setting, the listed building is situated within its surrounding graveyard alongside the attached ruined church, which provides an understanding of the historic context of the later listed building. The church is set back, but highly visible, from the adjacent road to the south, which affords the most common experience of the asset. From the grounds of the church there are wide views south over the modern developments in the settlement towards the lower-lying land that formed the church's historic parish.

These views also afford glimpses of the spire of the Church of St Catherine in Burbage.

13.71 In these views from the church there is an experience of the north-western portions of the Main HNRFI Site, which also have an historical functional association, having formed part of the Elmesthorpe parish associated with the church, albeit making only a very limited contribution to the significance of the asset through this association (Photoviewpoint and Photomontage 19).

13.72 Furthermore, although the church is not widely visible from the wider landscape, being located nestled into a south facing slope, the building can be glimpsed from northern parts of the Main HNRFI Site.

13.73 The Church of St Mary (1074693) is considered to be a sensitive receptor, due to the potential for development in the Main HNRFI Site to affect the appreciation of the church from the wider landscape and erode the appreciation of its historically associated wider agricultural setting.

13.74 The Church of St Mary at Elmesthorpe is deemed to be of high sensitivity based on the criteria for listed buildings as set out in Table 13.3.

Grade II Church of St Simon and St Jude (1074259), Earl Shilton*

13.75 The Grade II* Church of St Simon and St Jude (1074259) is located circa 2.4km north of the Main HNRFI Site in the settlement of Earl Shilton. The earliest surviving part of the church dates to the 15th century though it was largely rebuilt in 1855. The significance of this asset is primarily derived from its considerable architectural and historic interest within its built form. In terms of its setting, the church is located on a ridge of high ground within the historically long linear settlement of Earl Shilton, within the centre of a large walled churchyard. The church is also located adjacent to the scheduled remains of a motte and bailey castle, which suggests it was founded on the site of an earlier church, and as such is has some archaeological interest.

13.76 From the church there is no appreciation of the Main HNRFI Site and neither is there any apparent functional connection between the church and the Main HNRFI Site. However, due to the church's location on higher ground, the spire is visible from the wider area to the south, and as such there are some glimpsed views available from parts of the Main HNRFI Site towards the distant spire.

13.77 The Church of St Simon and St Jude is considered to be a sensitive receptor, due to the potential for development in the Main HNRFI Site to affect the appreciation of the church from the wider landscape.

13.78 The Church of St Simon and St Jude is deemed to be of high sensitivity based on the criteria set out in Table 13.3.

Grade II listed Church of All Saints (1177924), Sapcote

13.79 The Grade II Listed Church of All Saints at Sapcote (1177924) is located circa 2.1km south-

east of the Main HNRFI Site. The church dates to the mid-14th and 15th century and was restored in the 19th century. The significance of the building is primarily derived from the considerable historic, architectural and artistic interest of its built form. Its setting in the historic core of the settlement on the southern edge of Sapcote allows an appreciation of its context in relation to the surrounding historic buildings and space, as well as agricultural land to the south.

13.80 The church also forms a visible landmark within the settlement, reinforced by its high tower and spire. It is widely visible from many areas within and outside Sapcote, and as such it is experienced in a wider landscape context as a focal point and landmark of the settlement. There are some glimpsed views available from parts of the Main HNRFI Site which feature the spire in the distance. The church spire also features in views from the Grade I Church of St Mary at Barwell to the north, where it can be glimpsed in combination with the land within the Main HNRFI Site (Photoviewpoint and Photomontage 25).

13.81 From the church there is no appreciation of the Main HNRFI Site due to the intervening built form of the modern Sapcote settlement. Nonetheless, the Main HNRFI Site has an historical functional association, having formed part of the Sapcote parish associated with the church, albeit making only a very limited contribution to the significance of the asset through this association.

13.82 The Church of All Saints at Sapcote is considered to be a sensitive receptor, due to the potential for development in the Main HNRFI Site to affect the appreciation of the church from the wider landscape and erode its historically associated wider agricultural setting.

13.83 The Church of All Saints at Sapcote is deemed to be of high sensitivity based on the criteria for listed buildings as set out in Table 13.3.

Grade II listed Church of St Michael (1074704), Stoney Stanton

13.84 The Grade II Listed Church of St Michael at Stoney Stanton (1074704) is located circa 1.9km south-east of the Main HNRFI Site. It dates to the late 14th and 15th century and was restored in the 19th century. The significance of the building is primarily derived from the considerable historic, architectural and artistic interest of its built form, including its random granite rubble construction and west tower with spire. Its setting, prominent position in the core of the settlement, enclosed by its surrounding churchyard and green spaces allows an appreciation of its context in relation to the wider surrounding historic buildings and spaces of Stoney Stanton.

13.85 The church forms a visible landmark within the settlement, and it is widely visible from many areas within and outside Stoney Stanton as a focal point and landmark of the settlement. There are some glimpsed views available from parts of the Main HNRFI Site which feature the spire in the distance. The church spire also features in distant views from the Grade I Church of St Mary at Barwell to the north, where it can be glimpsed in combination with the land within the Main HNRFI Site (Photoviewpoint and Photomontage 25).

13.86 From the church there is no appreciation of the Main HNRFI Site due to the intervening

built form of the modern Stoney Stanton settlement, and there is no apparent functional connection between the church and the Main HNRFI Site.

13.87 The Church of St Michael at Stoney Stanton is considered to be a sensitive receptor, due to the potential for development in the Main HNRFI Site to affect the appreciation of the church from the wider landscape.

13.88 The Church of St Michael at Stoney Stanton is deemed to be of high sensitivity based on the criteria for listed buildings set out in Table 13.3.

Grade II listed Church of St Catherine (1295212), Burbage*

13.89 The Grade II* listed Church of St Catherine (1295212) is located on the east side of Church Street in the Burbage, where the building, and the large yew trees in the surrounding churchyard, are defining elements of the street scene in the historic core. The church was built in 1842 but incorporates earlier medieval fabric and post-medieval monuments.

13.90 The immediate setting of the church is defined by the stone wall surrounding the church yard, within which lies a raised burial ground beyond the frontage to Church Road. The church yard extends east where it is enclosed by modern residential development and farm buildings. More widely, east from the churchyard, there are glimpsed views past modern development to the lower, predominantly agricultural land east of Burbage; the spire of the Church of All Saints in Sapcote (1177924) can also be glimpsed in the distance.

13.91 The significance of the building is primarily derived from the considerable historic, architectural and artistic interest of its built form, which also has value due to its archaeological interest. Its setting in the historic core of the settlement allows an appreciation of its context in relation to the surrounding historic buildings and spaces. The church also forms a visible landmark within the settlement, reinforced by its high three stage tower and recessed spire. It is widely visible from many areas within and outside Burbage, and as such it is experienced in a wider landscape context as a focal point and landmark of the settlement.

13.92 From the church there is no appreciation of the Main HNRFI Site, and there is no apparent functional connection between the church and the Main HNRFI Site. However, due to the church's location on higher ground, the spire is visible from the wider area to the north and east. There are some glimpsed views available from parts of the site towards the spire, and the Main HNRFI Site also features as part of the wider agricultural land in views from the Church of St Mary (1074693) at Elmbridge towards the spire of the Church of St Catherine at Burbage.

13.93 The Church of St Catherine is considered to be a sensitive receptor, due to the potential for development in the Main HNRFI Site to affect the appreciation of the church from the wider landscape.

13.94 The Church of St Catherine is deemed to be of high sensitivity based on the criteria for listed buildings as set out in Table 13.3.

Aston Flamville Conservation Area

13.95 Aston Flamville Conservation Area is located circa 50m south-east of the Main Order Limits (where the land inside the DCO Order Limits cover the highway of the M69). The conservation area encompasses the historic core of the small rural settlement with medieval origins, which is focussed around the principal roads of Lychgate Lane and Hinckley Road and contains a number of historic listed buildings, as previously set out above. Aside from modern infill north of Lychgate Lane and the small development at Manor House Close, the settlement has undergone very little development since the post-medieval period and the historic layout and relationships between the historic buildings, including the manor house, church and farmhouses are still legible and contribute greatly to its character and appearance.

13.96 The conservation area appraisal of 1975 notes that the village contains a number of well-maintained historic buildings, which are the main contributors to its character and appearance. It also notes that the visual links with the countryside are key to the experience of the area, along with the open spaces within the village. In this respect, the conservation area designation takes in a large swathe of undeveloped agricultural fields to the west of the properties on Lychgate Lane, that form the historical rural setting to the properties in the settlement.

13.97 The setting of the conservation area is largely defined by its low-lying position and its enclosure on all sides by surrounding agricultural land, that reinforces the historic context of the settlement as a rural hamlet and makes a positive visual contribution to the conservation area.

13.98 The M69, forming a hard boundary to the northwest of the conservation area limits the appreciation of the wider setting of the conservation area in this direction. The motorway also creates a hard boundary and area of separation between the conservation area and the Main HNRFI Site north of the M69 Junction 2.

13.99 While parts of the agricultural fields in the western portion of the conservation area are notionally located within the Zone of Theoretical Visibility (ZTV), in reality, a ridge of intervening high ground to the north of the settlement screens the Main HNRFI Site north of the M69 Junction 2. As such, from within the conservation area, there is currently no appreciation of the Main HNRFI Site due to the intervening built form within the settlement and the rising agricultural land beyond. While the conservation area is located in the same historic parish as the southern part of the Main HNRFI Site, there are no evident functional or visual associations that can be appreciated, as the Main HNRFI Site does not form part of the conservation area's wider agricultural setting, and has furthermore been physically and visually severed form this wider land by the hard boundary of the M69 motorway to the north-west.

13.100 Nonetheless, the proximity of the conservation area to the arm of the DCO Site within the M69 highway boundary means there is some limited potential for the Proposed Development to alter the contribution of setting to the heritage interest of this conservation area, and the ability to appreciate its significance. Therefore, Aston Flamville

Conservation Area is considered to be a sensitive receptor.

13.101 The Aston Flamville Conservation Area is deemed to be of medium sensitivity based on the criteria for conservation areas set out in Table 13.3.

Non-designated Heritage Assets

Archaeology

Main HNRFI Site

13.102 The baseline archaeological assessment (Technical Appendix 13.1) established that the Leicestershire HER records only two non-designated heritage assets within the boundary of the Main HNRFI Site, comprising an undated ditch recorded as a cropmark (MLE68), and a 18th century barn (MLE20555).

13.103 Geophysical survey and archaeological trial trench evaluation (Appendices 13.3 - 5) undertaken within the Main HNRFI Site and across the A47 Link Road to date has identified few non-designated heritage assets in the form of below ground remains.

13.104 Within the extents of the Main HNRFI Site south of the railway, the archaeological investigations recorded activity ranging from the late Iron Age to 20th centuries, including most notably evidence for dispersed Roman rural settlement activity. This included evidence of Late Iron Age to Romano-British field systems to the east of the Elmesthorpe Plantation and settlement activity focused on a probable roundhouse located west of Hobbs Hayes Farm.

13.105 The Romano-British activity was overlain by the remains of a medieval landscape consisting of ridge and furrow which was superseded in turn by an enclosed system of 18th century fields focused on a newly constructed farmstead and the alignment of Burbage Common Road. The final episodes of significant change occurred with the construction of the railway between Hinckley and Leicester in the 1860's, and the M69 Motorway in the 1970's.

13.106 While the final results of this programme of archaeological work is forthcoming, the preliminary results indicate that any remains that are present within the Main HNRFI Site are likely to be of no more than low to medium sensitivity.

The DCO Site beyond the Main HNRFI Site

13.107 The baseline archaeological assessment (Technical Appendix 13.1) established that no known archaeological features are recorded in the A47 Link Road or land to its south within the Main Order Limits, while the geophysical survey in this location did not indicate the presence of any remains predating medieval agricultural activity and 18th century enclosure of the land.

13.108 Within the remainder of the DCO Site beyond the Main HNRFI Site, while a number of

these areas of Proposed Development are located in proximity to areas of archaeological potential, such as highways works within the historic cores of the settlements of Stoney Stanton and Sapcote, in reality the proposed changes within these areas are so limited; involving only additional signage, occasional road calming measures and minor adjustments to the existing highway or railway network, that there is considered to be no potential for any works in these areas to interact with significant archaeological remains or result in any significant adverse effects in this respect.

Built Form

13.109 The assessment of the built form within the Main HNRFI Site as part of the baseline heritage assessment (Technical Appendix 13.2) identified three post-medieval farmsteads within the Main HNRFI Site. The significance of these farmsteads can be attributed primarily to the standing remains of the principal farm buildings and barns of late 18th century date within them, rather than their archaeological potential.

13.110 Even so, the three identified buildings of heritage interest within the Main HNRFI Site, comprising a former farmhouse at Woodhouse Farm (HB1 on Figure 13.3), a converted barn at Hobbs Hayes (HB2 on Figure 13.3) corresponding to the barn identified as (MLE20555) by the HER, and a former stable range at Freeholt Lodge (HB3 on Figure 13.3), are each considered to be heritage assets of, at most, of low importance.

13.111 The Burbage Common Road bridge is also located within the Main HNRFI Site, where it carries the Burbage Common Road over the railway line that defines the western boundary of the Main HNRFI Site. The significance of the bridge is derived from the fabric of its built form and its limited architectural interest as a late 19th century structure associated with the railway. The Burbage Common Road bridge is considered to be a heritage asset of low importance, based on the criteria set out in Table 13.3.

Historic Landscape

13.112 The Main HNRFI Site is identified as lying within a landscape created predominantly as a result of parliamentary enclosure of the 18th century, which has experienced subsequent reorganisation in 19th and 20th centuries.

13.113 Whilst the Main HNRFI Site is not situated within a landscape of significant historic landscape value, it still contains a number of internal field boundaries that reflect its pattern of enclosure since the 18th century. Nonetheless, the historic landscape of the Main HNRFI Site is considered to be of no more than low sensitivity.

13.114 The historic landscape of the landscape in the location of the A47 Link Road, is similarly a result of parliamentary enclosure of the 18th century, which has experienced subsequent reorganisation in 19th and 20th centuries and of no more than low sensitivity.

13.115 The remainder of the areas of the DCO Site beyond the Main HNRFI Site and A47 Link Road, are defined by off-site highways and junctions within the extents of the modern highways network, or located within the existing railway infrastructure. Accordingly, they have no

historic landscape value.

POTENTIAL SIGNIFICANT ENVIRONMENTAL EFFECTS OF THE PROPOSAL

13.116 The following paragraphs identify and describe each effect that is predicted to arise, as a result of the Proposed Development, on both designated and non-designated heritage assets. These have been assessed in terms of effects during construction, where direct impacts may be anticipated, and also the operation phases where impacts, in terms of an asset's setting, may be anticipated; and whether these effects are adverse or beneficial.

Construction Impacts and Effects

13.117 The following section provides an assessment of the effects on cultural heritage receptors likely to arise as a result of the construction phase of the proposals.

13.118 It addresses only the direct, physical effects of construction activities contained within the DCO Site and does not cover potential changes to the wider settings of heritage assets. These are addressed under the operation phase because, even though it is recognised that they will first arise during construction (with the potential installation of cranes etc.), they will emerge over time and will ultimately reach their fullest extent following the completion of the Proposed Development.

13.119 In short, it is expected that any setting effects during construction will either be short-lived because of the temporary nature of the activity or lower magnitude versions of effects which will be captured and assessed in respect of the completed development anyway.

13.120 Therefore, whilst the potential for construction activities in the DCO Site to have indirect (setting) effects on both designated and non-designated heritage assets is not dismissed, the chapter identifies and assesses them at the operation phase in order to capture the worst-case scenario; in other words when they have reached their maximum extent.

13.121 The construction activities within the bulk of the Main HNRFI Site currently occupied by agricultural land are considered to have clear potential for physical effects on heritage assets in this location. The proposals for an extension to the country park across the land south of the A47 Link Road, and the A47 Link Road itself, has similar potential for comparable impacts.

13.122 In contrast, the remaining elements of the Proposed Development beyond the Main HNRFI Site and A47 Link Road; i.e., the off-site highways and junctions and railway infrastructure; are not considered to have any implications for direct construction effects on any heritage assets. They are focused largely in the highways or railway extents, with limited additional land required. None of the proposed works are within conservation areas, or physically affect listed buildings or other designated or non-designated heritage assets. Therefore, the following sections do not include or require reference to these off-site works, instead focussing on the effects of construction activities within the Main HNRFI Site and adjoining land south of the A47 link and within the A47 Link Road alignment.

Designated Heritage Assets

13.123 There will be no direct impacts arising from the construction of the Proposed Development on the one scheduled monument, seven listed buildings and one conservation area that are identified as sensitive receptors. Any indirect effects are likely to arise through changes within their setting, and as such, are described within the operation impacts and effects section in order to capture the worst-case scenario; in other words when they have reached their maximum extent. On this basis, there will be no change and the potential significance of the effect of the construction phase on these receptors has been assessed as neutral and not significant.

Non-designated Heritage Assets

Archaeology

13.124 The primary effect of the Proposed Development on the archaeological resource is likely to result from direct truncation and/or removal of remains during groundwork. All of the archaeological remains identified within the Main HNRFI Site – whether previously recorded or hitherto unknown - are potentially subject to direct impact during development. This is likely to result in substantial or total destruction of archaeological remains which is considered a large magnitude of change.

13.125 As previously established, the baseline assessment progressed to date has established that it is unlikely that any archaeological assets present within the Main HNRFI Site - whether previously recorded or hitherto unknown - will be of greater than low to medium sensitivity. As such, the large magnitude of change to these receptors, if left unmitigated, will result in, at most, a moderate adverse effect, which is not significant.

Built Form

13.126 The baseline assessment has established that the Main HNRFI Site contains three non-designated heritage assets of low sensitivity associated with late post-medieval to modern agricultural exploitation across the Main HNRFI Site, comprising two historic barns and a historic farmhouse. The proposals will require the demolition of these assets, thereby resulting in a large magnitude of change during the construction phase. On this basis, the Proposed Development would result in a direct moderate adverse significance of effect to each of these assets, which is not significant.

13.127 The Burbage Common Road bridge is also located within the Main HNRFI Site, where it carries the Burbage Common Road over the railway line that defines the western boundary of the Main HNRFI Site. The Proposed Development will require the demolition of the bridge, thereby resulting in a large magnitude of change to this asset of low importance during the construction phase. On this basis, the Proposed Development would result in a direct moderate adverse significance of effect to this receptor, which is not significant.

Historic Landscape

13.128 The land use change of the Main HNRFI Site and A47 Link Road from predominantly open fields to a national rail freight interchange and associated road infrastructure will drastically alter the character of the Main HNRFI Site and the land within and south of A47 Link and the construction of the proposals will require the removal and/or partial loss of most hedgerows. However, the land within these areas of the DCO Site is of low sensitivity in terms of its historic landscape character. A large magnitude of change from the construction of the Proposed Development in these areas is therefore predicted, resulting in a moderate adverse effect overall on this low sensitivity receptor, that is not significant.

Operational Impacts and Effects

13.129 The following section examines the effects of the Proposed Development on cultural heritage receptors during the operational phase.

Designated Heritage Assets

Elmesthorpe Church Scheduled Monument

13.130 The significance of the Elmesthorpe Church scheduled monument is predicted to be affected by the operation of the Proposed Development through change within its wider setting, specifically the visibility of the Proposed Development in the Main HNRFI Site in views towards the ruined church from the wider landscape, through the loss of elements of its historically associated wider agricultural setting, and the erosion of the appreciation of its historically associated wider agricultural setting from the monument itself.

13.131 The Proposed Development within the Main HNRFI Site is predicted to be visible in views south from the scheduled monument towards the Church of St Catherine in Burbage, adversely affecting the ability to appreciate the ruined church in context with part of its historically associated agricultural setting (Photoviewpoint and Photomontage 19). Furthermore, the appreciation of the significance of the church will also be adversely affected to a negligible extent by the loss of localised views towards the ruined tower from parts of the land within the Main HNRFI Site.

13.132 These impacts, while representing a noticeable change in the setting of the asset, are expected to result in negligible change to the significance of the scheduled monument, resulting in a permanent minor adverse effect on this asset of high sensitivity, that is not significant.

Grade II listed Wentworth Arms and Adjoining Stables (1307251)

13.133 The significance of the Grade II listed Wentworth Arms and Adjoining Stables (1307251) is predicted to be affected by the operation of the Proposed Development through change within its wider setting, specifically the visibility of the Proposed Development in the Main HNRFI Site when viewing the listed building from its roadside setting.

13.134 The Proposed Development is predicted to result in minor change to the highway to the north of the listed building. However, it is expected that there would be no material change to the current experience of the listed building through the operation of these works. The loss of agricultural land which cannot be appreciated from or in combination with the listed building, and any potential glimpsed views of the built form of the Proposed Development in the Main HNRFI Site beyond the public house from the adjacent road are predicted to result in no more than a negligible magnitude of effect, which will result in a permanent minor adverse significance of effect, which is not significant.

Grade I Listed Church of St Mary (1074229)

13.135 The significance of the Grade I Listed Church of St Mary (1074229) at Barwell is predicted to be affected by the operation of the Proposed Development in the Main HNRFI Site through change within its wider setting, specifically the visibility of the Proposed Development in the Main HNRFI Site in views towards the church from the wider landscape, and through the loss of elements of its historical wider agricultural setting in views out from the church.

13.136 The Proposed Development in the Main HNRFI Site is predicted to be visible in views south from the church, adversely affecting the ability to appreciate the church in context with its historical agricultural setting (Photoviewpoint and Photomontage 25). Furthermore, the appreciation of the significance of the church will also adversely affected to a negligible extent by the loss of localised views towards the church tower from parts of the land within the Main HNRFI Site.

13.137 These impacts, while representing a noticeable change in the setting of the asset, are expected to result in negligible change to the significance of the listed church, resulting in a permanent minor adverse effect on this asset of high sensitivity, that is not significant.

Grade II Listed Church of St Mary (1074693)

13.138 The significance of the Grade II Listed Church of St Mary (1074693) at Elmesthorpe is predicted to be affected by the operation of the Proposed Development in the Main HNRFI Site through change within its wider setting, specifically the visibility of the Proposed Development in the Main HNRFI Site in views towards the church from the wider landscape, and through the loss of elements of its historically associated wider agricultural setting, and the erosion of the appreciation of its historically associated wider agricultural setting from the church itself.

13.139 The Proposed Development in the Main HNRFI Site is predicted to be visible in views south from the church towards the Church of St Catherine in Burbage, adversely affecting the ability to appreciate the church in context with part of its historical associated agricultural setting (Photoviewpoint and Photomontage 19). Furthermore, the appreciation of the significance of the church will also be adversely affected to a negligible extent by the loss of localised views towards the church tower from parts of the land within the Main HNRFI Site.

13.140 These impacts, while representing a noticeable change in the setting of the asset, are expected to result in negligible change to the significance of the listed church, resulting in a permanent minor adverse effect on this asset of high sensitivity, that is not significant.

Grade II listed Church of St Simon and St Jude (1074259)*

13.141 The significance of the Grade II* listed Church of St Simon and St Jude (1074259) at Earl Shilton is predicted to be affected by the operation of the Proposed Development in the Main HNRFI Site through change within its wider setting, specifically the visibility of the Proposed Development in the Main HNRFI Site in views towards the church from the wider landscape.

13.142 The appreciation of the significance of the church is expected to be adversely affected to a negligible extent by the loss of localised views towards the church spire from parts of the land within the Main HNRFI Site.

13.143 These impacts, while representing a noticeable change in the setting of the asset, are expected to result in negligible change to the significance of the listed church, resulting in a permanent minor adverse effect on this asset of high sensitivity, that is not significant.

Grade II listed Church of All Saints (1177924)

13.144 The significance of the Grade II Listed Church of All Saints at Sapcote (1177924) is predicted to be affected by the operation of the Proposed Development in the Main HNRFI Site through change within its wider setting, specifically the visibility of the Proposed Development in the Main HNRFI Site in views towards the church from the wider landscape, and through the loss of elements of its historically associated wider agricultural setting.

13.145 The Proposed Development in the Main HNRFI Site is predicted to be visible in views towards the church from the Church of St Mary at Barwell, adversely affecting the ability to appreciate the church in context with part of its historical agricultural setting (Photoviewpoint and Photomontage 25). Furthermore, the appreciation of the significance of the church will also adversely affected to a negligible extent by the loss of localised views towards the church spire from parts of the land within the Main HNRFI Site.

13.146 These impacts, while representing a noticeable change in the setting of the asset, are expected to result in negligible change to the significance of the listed church, resulting in a permanent minor adverse effect on this asset of high sensitivity, which is not significant.

Grade II listed Church of St Michael (1074704)

13.147 The significance of the Grade II Listed Church of St Michael at Stoney Stanton (1074704) is predicted to be affected by the operation of the Proposed Development in the Main HNRFI Site through change within its wider setting, specifically the visibility of the Proposed Development in the Main HNRFI Site in views towards the church from the wider landscape.

13.148 The Proposed Development in the Main HNRFI Site is predicted to be visible in views towards the church from the Church of St Mary at Barwell, adversely affecting the ability to appreciate the church in context with part of its historical agricultural setting (Photoviewpoint and Photomontage 25). Furthermore, the appreciation of the significance of the church will also adversely affected to a negligible extent by the loss of localised views towards the church spire from parts of the land within the Main HNRFI Site.

13.149 These impacts, while representing a noticeable change in the setting of the asset, are expected to result in negligible change to the significance of the listed church, resulting in a permanent minor adverse effect on this asset of high sensitivity, which is not significant.

Grade II listed Church of St Catherine (1295212)*

13.150 The significance of the Grade II* listed Church of St Catherine (1295212) at Burbage is predicted to be affected by the operation of the Proposed Development in the Main HNRFI Site through change within its wider setting, specifically the visibility of the Proposed Development in the Main HNRFI Site in views towards the church from the wider landscape.

13.151 The Proposed Development in the Main HNRFI Site is predicted to be visible in views towards the church from the Church of St Mary (1074693) at Elmesthorpe (Photoviewpoint and Photomontage 19), adversely affecting the ability to appreciate the church in context with part of its historical agricultural setting. Furthermore, the appreciation of the significance of the church will also adversely affected to a negligible extent by the loss of localised views towards the church spire from parts of the land within the Main HNRFI Site.

13.152 These impacts, while representing a noticeable change in the setting of the asset, are expected to result in negligible change to the significance of the listed church, resulting in a permanent minor adverse effect on this asset of high sensitivity, which is not significant.

Aston Flamville Conservation Area

13.153 The significance of the Aston Flamville Conservation Area, a receptor of medium sensitivity, has the potential to be affected through changes to the part of the DCO Site within the M69 highway boundary to the west of the conservation area, the loss of historically associated agricultural land and through potential distant glimpses of the built form of the Proposed Development in the Main HNRFI Site beyond the rising ground to the north.

13.154 However, in terms of the proposed changes to the M69, it is expected that there would be no material change to the current experience of the conservation area through the operation of these elements of the Proposed Development. The loss of historically associated agricultural land, which cannot be appreciated from the conservation area, and any potential glimpsed views of the Proposed Development in the Main HNRFI Site beyond the ridge to the north (Photoviewpoint 39), are predicted to result in no more than a negligible magnitude of effect, which will result in a permanent negligible adverse

significance of effect, that is not significant.

Non-designated Heritage Assets

13.155 All effects on non-designated archaeological assets, non-designated built form and the historic landscape, within the DCO Site will occur during the construction phase; therefore, there are no effects during the completed/occupation phase.

PROPOSED MITIGATION

13.156 The hierarchical approach towards mitigation (prevent, reduce, offset) will be to avoid, where possible, any effects through the overall design of the proposals, the disposition of its elements (prevent), and, subsequently through careful siting of the different elements of the proposals and its required infrastructure (reduce).

13.157 Embedded mitigation provides a form of preventative mitigation and has been considered as an integral part of the overall design and locational strategy for the Proposed Development. It is not an 'add-on' measure to ameliorate significant environmental effects, but part of the positive and pro-active approach whereby mitigation has been assessed and considered at all stages of the project to prevent or reduce the occurrence of potentially significant environmental effects.

13.158 Potential adverse effects on archaeology and built heritage receptors have been identified at the design stage and as a consequence mitigation measures have been incorporated into the submitted design to eliminate, reduce or offset any adverse effects, as appropriate.

13.159 The Proposed Development provides for the implementation of a landscape strategy for the Main HNRFI Site, which will include proposed bunding and structured landscaping around the boundary of the Main HNRFI Site. This landscaping strategy will seek to appropriately screen development and minimise its visual impact on the surrounding landscape and cultural heritage receptors.

Construction

13.160 The baseline assessments have demonstrated that buried archaeological remains are present within the Main HNRFI Site. To mitigate the permanent direct effects of construction on buried archaeological remains, the applicant will carry out a further phased programme of post-consent archaeological mitigation works to be undertaken in advance of construction, in accordance with NPS policy. This will likely comprise targeted areas of archaeological excavation prior to development carried out under Written Schemes of Investigation (WSI) that conform to recognised standards and guidance and which will have been prepared in consultation with and approved by the Leicestershire County Council archaeological advisor.

13.161 The moderate significance of effect from the Proposed Development on the three non-designated farm buildings within the centre of the Main HNRFI Site can be appropriately mitigated through a programme of building recording in advance of demolition.

13.162 Similarly, the moderate significance of effect from the Proposed Development on the Burbage Common Road railway bridge on the western boundary of the Main HNRFI Site can be appropriately mitigated through a programme of building recording in advance of demolition.

Operation

13.163 It is anticipated that all necessary mitigation relating to archaeological remains will be undertaken prior to, or during, the construction phase of the Proposed Development. Therefore, no further mitigation will be required during the operation phase as all adverse effects will already have been mitigated as far as reasonably practicable.

13.164 The implementation of bunding and tree screening as part of a landscape strategy for the Main HNRFI Site will, to some degree, limit the identified effects of the Proposed Development in terms of changes to the setting of designated heritage assets in the wider area. No mitigation measures are identified to further offset the minor adverse significance of effect to the identified designated heritage assets.

RESIDUAL ENVIRONMENTAL EFFECTS

13.165 It is anticipated that, through the implementation of the landscape design strategy for the Main HNRFI Site and the adoption of appropriate mitigation measures, the Proposed Development will result in no significant residual environmental effects on archaeological heritage assets.

13.166 Implementation of mitigation works to investigate and record archaeological remains, the non-designated farm buildings and Burbage Common Road bridge within the Main HNRFI Site prior to their removal by construction is expected to result in a reduced residual effect identified as neutral.

13.167 Residual effects on designated heritage assets resulting from changes to their settings is unlikely to change following mitigation, however the significance of effect to all such assets is considered to be at most minor adverse and not significant

13.168 A residual environmental effect from the Proposed Development will remain in respect of the permanent moderate adverse effect on the historic landscape of the Main HNRFI Site and A47 Link Road, but still not significant.

Table 13.7: Assessment of Likely Residual Environmental Effects.

Receptor	Sensitivity of Receptor	Nature of Impact	Impact Magnitude	Significance	Additional Mitigation	Residual Impact Magnitude	Residual Significance of Effect
Construction Effects							
Known and unknown non-designated archaeology receptors within the site	Negligible to low	Direct impact on fabric during construction	Large adverse	Negligible to Minor to Moderate adverse	Completion of archaeological mitigation in advance of the construction phase	Negligible adverse	Neutral
Non-designated farm buildings within the site	low	Demolition during construction	Large adverse	Moderate adverse	Completion of building recording mitigation in advance of the construction/ demolition phase	Negligible adverse	Neutral
Non-designated Burbage Common Road bridge	low	Demolition during construction	Large adverse	Moderate adverse	Completion of building recording mitigation in advance of the construction/ demolition phase	Negligible adverse	Neutral

Receptor	Sensitivity of Receptor	Nature of Impact	Impact Magnitude	Significance	Additional Mitigation	Residual Impact Magnitude	Residual Significance of Effect
Historic landscape	low	Direct impact on fabric during construction	Large adverse	Moderate adverse	n/a	Large adverse	Moderate adverse
Operation Effects							
Scheduled monument, listed buildings x7 and conservation area identified as sensitive receptors	High to medium	Potential impact on setting	Negligible adverse	Negligible to minor adverse	Implementation of landscape design strategy	Negligible adverse	Negligible to minor adverse
Cumulative Effects							

Effect	Description	Mitigation	Significance
N/A	N/A	N/A	N/A

Receptor	Sensitivity of Receptor	Nature of Impact	Impact Magnitude	Significance	Additional Mitigation	Residual Impact Magnitude	Residual Significance of Effect
Impact of Climate Change							
Effect	**Description**				**Mitigation**		**Significance**
N/A	N/A				N/A		N/A

CUMULATIVE AND IN-COMBINATION EFFECTS

13.169 This assessment will consider the cumulative effect of the Proposed Development alongside the effect of other developments in the geographical area as set out in the schedule of committed schemes.

13.170 At this stage there is expected to be no change in the significance of effects on any archaeological or built heritage receptor in the DCO Site due to either the construction or operation phases of the proposals, when considered alongside any other plans and projects that are proposed or consented but not yet built and operational (i.e. those developments that are separate from the baseline).

13.171 As the effects of the construction phase on non-designated heritage assets within the DCO Site will be limited to the extents of the Main HNRFI Site and A47 Link Road, there is expected to be no cumulative effects in combination with the other sites under consideration.

13.172 The moderate adverse effect of the Proposed Development on the historic landscape within the Main HNRFI Site and A47 Link Road is not expected to increase through the implementation of any of the cumulative schemes.

13.173 The occupation phase is predicted to result in only a minor adverse effect on each of the designated heritage assets identified as sensitive receptors. Due to the likely distance between these receptors and the other sites under consideration, there are expected to be no cumulative effects on designated heritage assets in combination with any other plans and projects that are proposed or consented but not yet built and operational.

13.174 As such there is no potential for significant adverse effects to result from the construction or occupation of the Proposed Development in combination with any of the other sites under consideration. A full consideration of the likely effects from the identified short list will be reported in the ES.

CLIMATE CHANGE

13.175 The impact of climate change on cultural heritage receptors is assessed through consideration of a potential future baseline scenario. Utilising the climate change projections set out in the relevant chapter of the ES, this assessment will consider how potential climate change may alter the predicted effects contained within this ES cultural heritage chapter. Whilst it is unlikely that completely new direct impacts will arise as a result of climate change based on the current conditions, the geographic spread or scale of potential impacts might be changed when considered against the future baseline conditions.

13.176 However, for cultural heritage, it is anticipated that the future baseline under a climate

change scenario would not lead to any greater, or different, effects to those predicted.

FURTHER WORK

13.177 This PEIR describes the likely significant effects of the Proposed Development, based on survey and assessment work completed to date. Further survey and assessment work is programmed to be undertaken before the ES is completed to inform the EIA.

13.178 With respect to cultural heritage, this will comprise the finalisation of the archaeology baseline for the DCO Site, following completion of the programme of archaeological trial trenching, which will in turn lead to an updated archaeological baseline assessment (Technical Appendix 13.1).

13.179 Further work will also include the finalisation of the Proposed Development scheme, which will enable the production of detailed photomontages to more accurately predict the visual change to the setting of relevant designated heritage assets.

SUMMARY AND CONCLUSIONS

13.180 This chapter assesses the likely significant effects of the Proposed Development in terms of archaeology and cultural heritage, based on the current information available as part of the evolving baseline.

13.181 A baseline assessment, in the form of desk-based assessment and investigative fieldwork and field surveys has identified potentially sensitive cultural heritage receptors (heritage assets) within the DCO Site and its wider zone of influence.

13.182 The assessment established that the DCO Site contains no designated heritage assets. However, one scheduled monument, seven listed buildings, and a single conservation area located in the wider area are considered to be potentially sensitive heritage assets, where change to the setting of these assets as a result of the Proposed Development has the potential to adversely affect their heritage interest.

13.183 The DCO Site does not contain any known non-designated assets or archaeological deposits which are considered to be of greater than low to medium sensitivity.

13.184 However, it is possible that the Main HNRFI Site may contain hitherto unidentified archaeological features and deposits. Whilst these could include evidence for activity dating from the prehistoric to modern periods, the majority of activity is most likely to derive from the medieval and later agricultural exploitation of the landscape; i.e. field boundaries and plough-soils. It is unlikely that any previously unidentified archaeological assets present within the site will be of greater than low to medium sensitivity.

13.185 The historic landscape of the Main HNRFI Site is characterised by re-organised 18th century fieldscapes, which are considered to be of no greater than low sensitivity.

13.186 Three historic farm buildings have been identified within the farmsteads of Woodhouse Farm, Hobbs Hayes and Freeholt Lodge, within the Main HNRFI Site. These non-designated buildings are considered to be of low sensitivity. The Burbage Common Road bridge on the western boundary of the Main HNRFI Site is also a non-designated building of low sensitivity.

13.187 In terms of the scheduled monument, seven listed buildings, and conservation area in the wider area that are identified as sensitive receptors, mitigation will be incorporated into the design to reduce the potential adverse impact of the Proposed Development through change to the setting of these assets. Therefore, there is predicted to be, at most, only a minor adverse effect on each of these heritage assets.

13.188 In terms of the potential impact of the Proposed Development proposals on known and unknown non-designated archaeological receptors, this is expected to be contained to within the Main HNRFI Site and A47 Link Road. It is expected that further mitigation, in the form of archaeological investigation and recording, will be set out in a DCO requirement should consent be granted, in advance of or during construction. This will extend to a programme of appropriate field investigation and mitigation, incorporating publication of the results and deposition of the archive with the relevant museum.

13.189 In general terms, the implementation of the construction and operation phases of the Proposed Development, incorporating mitigation, is predicted to have at most a minor or moderate adverse effect on the designated and non-designated heritage assets identified within the DCO Site and wider study area.

13.190 None of the predicted adverse effects on designated or non-designated archaeology and built heritage assets, either during the construction or operation phases of the Proposed Development, are deemed to be of greater than moderate significance and, therefore, are not considered to be 'significant' in EIA terms.

13.191 In policy terms, all the potential adverse effects on designated heritage assets identified in this ES Chapter equate to 'less than substantial harm', at the low end of this scale of harm.

Tritax Symmetry (Hinckley) Limited

HINCKLEY NATIONAL RAIL FREIGHT INTERCHANGE

Preliminary Environmental Information Report

Chapter 14: Surface water and flood risk

January 2022

This document forms a part of a Preliminary Environmental Information Report (PEIR) for the Hinckley National Rail Freight Interchange project.

A PEIR presents environmental information to assist consultees to form an informed view of the likely significant environmental effects of a proposed development and provide feedback.

This PEIR has been prepared by the project promoter, Tritax Symmetry (Hinckley) Limited. The Proposed Development is described in Chapter 3 of the PEIR and is the subject of a public consultation running from 12 January to 9 March 2022.

Details of how to respond to the public consultation are provided at the end of Chapter 1 of the PEIR and on the project website:

http://www.hinckleynrfi.co.uk/

This feedback will be taken into account by Tritax Symmetry (Hinckley) Limited in the preparation of its application for a Development Consent Order for the project.

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14 ◆ Surface water and flood risk

INTRODUCTION

14.1. This PEIR chapter assesses the potential impacts of the proposed Hinckley National Rail Freight Interchange (HNRFI) development and contiguous road connections (i.e., the A47 Link Road), as well as off-site works, on-site surface water and flood risk matters. It includes an assessment of the potential cumulative impact of the HNRFI in combination with other surrounding significant proposed developments. In particular, consideration is given to effects that might arise during construction and operation in terms of flood risk, surface water drainage, surface water quality, ground water quality, water supply and surface and foul water sewerage capacity.

14.2. This PEIR chapter considers the impact of the Proposed Development upon the DCO Site and surrounding area in relation to existing baseline conditions and relevant legislation and national, regional and local planning policy with regard to hydrology, drainage and flood risk.

14.3. The chapter provides a description of the methods used in the assessment. This is followed by a description of the relevant baseline conditions of the Proposed Development and an assessment of the likely environmental effects of the Proposed Development during the construction works and once the Proposed Development is completed and operational. Mitigation measures are identified where appropriate to avoid, reduce or offset any significant adverse effects identified, together with the nature and significance of likely residual effects.

14.4. This PEIR chapter is accompanied by the following appendices:

- Appendix 14.1: Flood Risk Assessment (hydraulic modelling is referenced in, and modelling reports and Drainage Strategy are appended to, the FRA and Drainage Strategy).

- Appendix 14.2: Severn Trent Water Sewer Records and Developer Services Enquiries.

METHODOLOGY AND DATA SOURCES

EIA Scoping Opinion

14.5. An application for an EIA Scoping Opinion was submitted in November 2020. A Scoping Opinion from Planning Inspectorate on behalf of the Secretary of State was returned in response in December 2020.

14.6. Table 14.1 summarises the Planning Inspectorate's comments received in relation to

Surface Water and Flood Risk, and how these comments have been considered in TSH's assessment of this topic.

Table 14.1: Advice in the Secretary of State's EIA Scoping Opinion concerning the assessment of flood risk and drainage (December 2020)

PINS ID Paragraph	Ref	Comments	Response
4.8.2 Table 13.1	Assessment of new roads and alterations to roads.	The Scoping Report (Table 13.1 (ID 1)) states that new roads and alterations to existing roads have been included in this revised Scoping Report, and the approach to assessment will be agreed through consultation with relevant consultees. The ES should make reference to the new access road and alterations to the M69 and include an assessment of how the construction of the access road and the alteration of existing roads will affect the assessment of impacts from surface water and flood risk. The approach to this assessment to be discussed with relevant consultees should take into account the latest applicable guidance.	Assessment of the wider highway works in line with latest applicable guidance is included throughout the PEIR Chapter. Consultation has been undertaken with relevant stakeholders to discuss the approach.
4.8.3 13.37-13.38	Receptors	The ES should explain how effects on key receptors including existing infrastructure, habitats/sites of ecological value or local residents have been considered, and the Applicant should seek to agree receptors with relevant statutory consultees including the Environment Agency (EA). A preliminary Water Framework Directive (WFD) assessment should be carried out to inform the assessment of impacts from the Proposed Development on WFD waterbodies.	Consultation has been undertaken with relevant stakeholders to discuss the approach. The PEIR Chapter will also identity the key flood risk receptors (Table 14.7). A WFD assessment has been undertaken as part of PEIR Chapter Eleven: Ecology and Biodiversity.
4.8.4	Assessment	The Scoping Report describes the	This assessment has

PINS ID Paragraph	Ref	Comments	Response
13.63	area	Study Area as including 'areas within and immediately adjacent to the Main HNRFI Site, including the western link road and Eastern Villages by-pass'. The works to the M69 Junction 23 / M1 Junction 21 are not mentioned, nor are the wider highways management works. The ES must assess the impacts of the Proposed Development in its entirety.	assessed the impact of the entire Proposed Development. (Note: works to the M69 Junction 23 / M1 Junction 21 and the Eastern Villages by-pass are no longer included in the proposed development and, therefore, do not need to be included in this assessment.
4.8.5 13.64	Consultation	The Scoping Report states that the ES will be supported and informed through consultations with various stakeholders. The ES should set out how the stakeholder consultation responses have influenced the assessment.	Stakeholder consultation has been undertaken and documented within this PEIR Chapter. Responses from the consultation have been considered when undertaking the assessments.
4.8.6 13.67	Methodology	The Scoping Report states that the assessment would consider the construction and operational stages of the Proposed Development over the lifetime of the proposed scheme, i.e., taking account of the potential influence of climate change on the surface water and flood risk receptors under consideration. The ES should set out the supporting information for the methodological approach and clearly explain how this has been applied to the assessment of effects for the lifetime of the Proposed Development including any decommissioning that is	A list of supporting information has been provided. Where further information and assessment is required to support the ES Chapter, this has been documented. Consideration of climate change has been included throughout the PEIR Chapter.

PINS ID Paragraph	Ref	Comments	Response
		anticipated. The assumptions and assessment made of climate change effects should be fully explained in the ES.	

Definition of study area

14.7. The Study Area is defined as the DCO Site. The Study Area is shown in Figure 14.1.

14.8. There are potential other significant receptors that exist beyond the Study Area, as well as cumulative effects, which will also be included within the PEIR. These receptors include flood risk and drainage pathways between the DCO Site and potential receptors such as the Thurlaston Brook, River Soar, the sewerage system and groundwater. As such, the assessment also covers a 1km buffer that has been applied to the Main HNRFI Site as this is considered to be the area which will have the greatest potential to affect surface water and flood risk outside of the DCO Site.

14.9. The EA assesses surface water and groundwater quality at a river catchment level. Therefore, when considering a potential for impact on downstream water quality, the potential for impacts at a river catchment level, rather than limited to a 1km radius, have been considered in this PEIR chapter.

14.10. The negligible impact of the off-site highway improvement works means the majority of the PEIR chapter relates to the Main HNRFI Site.

Consultation

14.11. ***2018 and 2019 Informal Consultation:*** Informal consultations were undertaken in 2018 and 2019 but no concerns were raised with regards to surface water and flooding.

14.12. ***Environment Agency (EA):*** The EA was initially consulted in October 2020 to determine what information it held on flood risk for the Study Area. The EA confirmed it does not hold any detailed hydraulic modelling, although it provided some limited hydrometric information and confirmed there are no licenced abstractions of groundwater or surface water.

14.13. The EA was further consulted in February 2021 on the proposed modelling approach. A hydraulic modelling method statement was prepared and provided to the EA which set out the intended approach to modelling. The EA has, subsequently, also reviewed the hydraulic modelling. The EA review comments have been considered when finalising the modelling and consultation is ongoing.

14.14. ***Leicestershire County Council (LCC):*** LCC, as the Lead Local Flood Authority ('LLFA') for this area, was consulted in October 2020 to ascertain what information, relevant to flood risk, the Council holds. LCC's response included information on known flooding incidents in

and close to the Study Area. It also advised on easement requirements for watercourses and ditches. The response confirmed that the LLFA is unable to approve modelling or a modelling methodology.

14.15. ***LCC (Highways):*** LCC Highways was consulted in March 2021 to determine what information it held on hydraulic structures (culverts and bridges) in the vicinity of the DCO Site. LCC's response included information on the one publicly maintained structure in the Study Area, and this culvert information has been used to inform the hydraulic modelling.

14.16. ***Local Planning Authorities:*** Hinckley and Bosworth Borough Council ('HBBC') and Blaby District Council ('BDC') were consulted to determine what information on flood risk and drainage they hold which may support the assessment. With the exception of Strategic Flood Risk Assessments (SRFIs), neither authority held any information pertinent to the Study Area. Further detail of the SRFIs is provided in the *Relevant law, policy and guidance* section of this PEIR chapter.

14.17. ***Warwickshire County Council:*** Warwickshire County Council ('WCC') was consulted in May 2021 in its capacity as a Lead Local Flood Authority ('LLFA') for its area. The consultation sought to agree the approach for assessing and managing flood risk, as well as requesting any historical flooding information in the Study Area. WCC confirmed that it is content with the proposed approach and that it was unaware of any known flooding issues within the DCO Site.

14.18. ***Severn Trent Water (STW):*** STW was contacted in January 2021 to obtain latest sewer records and to understand the capacity of the local sewer network to receive flows from the Proposed Development. The Pre-Development Enquiry (Appendix 14.2) confirmed that STW has previously modelled the Proposed Development and that the results demonstrated insufficient capacity on parts of the network. STW wishes to be kept informed when the HNRFI DCO Application is submitted as this will prioritise and determine how quickly the Main HNRFI Site can be assessed by its Growth Promotions Team to consider options for upgrading the network. The information provided by STW has been used in the preparation of this PEIR chapter and FRA and Drainage Strategy (Appendix 14.1).

14.19. STW was also consulted in March 2021 to obtain records of existing water mains and to understand the capacity of the network to meet the demand of the Proposed Development (Appendix 14.2). STW confirmed that the Proposed Development could be supplied from an existing trunk main.

14.20. ***National Highways*** (NH, formally Highways England (HE))**:** NH was consulted in October 2020 to determine what information it held on structures crossing beneath the stretch of the M69 in the vicinity of the Main HNRFI Site and A47 Link Road. Details on the surface water drainage for the M69 in the Main HNRFI Site area was also requested. A response from HE was received which provided plans indicating where there may be drainage assets present. Culvert information was also provided with the caveat that the information was indicative only; depths and pipe sizes could not be confirmed. The response also included an outline of HE's requirements prior to any intrusive works. Where suitable, the

information provided by HE has been used to inform the hydraulic modelling, FRA and Drainage Strategy for the Main HNRFI Site and A47 Link Road.

14.21. ***Network Rail:*** Network Rail was consulted in March 2021 to determine what information they held on structures crossing beneath the railway in the vicinity of the Main HNRFI Site. Network Rail responded with information on culverts and drainage systems for the Study Area. Where relevant, this information has been used to support the hydraulic modelling, FRA and Drainage Strategy.

Surveys

14.22. A watercourse survey was undertaken to support the hydraulic modelling. Surveys of watercourse cross sections including open channel and structures were undertaken to EA standards by BWB Consulting during April and May 2021. The survey included the watercourses through the link road route, as well as the primary watercourses leaving the Main HNRFI Site. Survey was not required in relation to other works.

14.23. Where access was not available during the watercourse survey due to landownership constraints or vegetation that prevented access, light detection and ranging (LiDAR) data have been used to supplement the survey. Where LiDAR coverage is limited, photogrammetry data, as the next best available dataset, have been used.

14.24. In addition to the above, the assessment has also used a topographical survey of the Main HNRFI Site. This topographical survey included the watercourses within the Main HNRFI Site and has been used to support the hydraulic modelling. The topographical survey is included as an appendix to the FRA and Drainage Strategy.

Assessment sources

14.25. The PEIR chapter has been informed by the following sources of information:

- *FRA and Drainage Strategy.* The FRA and Drainage Strategy utilised the following information which is also provided as appendices to the FRA and Drainage Strategy report:
  - topographical survey by MK Surveys (2018);
  - watercourse survey by BWB Consulting (2021); and
  - hydraulic flood modelling of the Main HNRFI Site undertaken by BWB Consulting Ltd (2021).
- *STW Sewer Records and Developer Services Enquiries* (Appendix 14.2); and
- *information provided as part of the consultation responses* (outlined in 'Consultation' section above).

Assumptions and limitations

14.26. The PEIR chapter and the FRA and Drainage Strategy (Appendix 14.1) are based on available data from the EA, STW and British Geological Survey (BGS). The accuracy of this information has not been verified.

14.27. The EA Flood Map for Planning does not include all the watercourses in the vicinity of the Main HNRFI Site. As such, hydraulic modelling has been undertaken to fill this data gap and understand the flood risk from all watercourses in the vicinity of the DCO Site. Accessibility issues have meant not all the watercourses in the Study Area have been surveyed. Additionally, LiDAR data are not available for the entire Study Area; the potential to fly LiDAR locally was investigated but was not feasible due to excessive electromagnetic interference. As a result, photogrammetry data have been used to supplement the watercourse survey for the hydraulic modelling.

14.28. The level of understanding in this PEIR chapter will be consolidated through further work to inform the PEIR, including a Highways Agency Water Risk Assessment (HAWRAT) and Sustainable Drainage Statement.

14.29. This assessment utilises the Design Manual for Roads and Bridges ('DMRB') guidance (see paragraph 14.53) for matters related to highway design. Where highways are not appraised, other best practice has been utilised.

Establishing baseline conditions

14.30. The baseline assessment has been undertaken in accordance with DMRB guidance and IEMA guidance on EIA. Baseline characterisation has been established through the FRA and Drainage Strategy (Appendix 14.1) and has comprised desktop study and hydraulic modelling, including:

- review of surface water hydrology, including water features and surface water drainage in the vicinity of the DCO Site based on EA geo-spatial data, location mapping, Ordnance Survey mapping and further topographic surveys carried out on behalf of the Applicant;
- identification of existing catchment pressures (e.g. point source and diffuse pollution issues) based on review of the EA's online catchment data explorer;
- identification of public water supplies within 1 km of the Main HNRFI Site (off-site works will have negligible impact on public water supplies);
- identification of any flood risks, typically associated with fluvial and surface water sources at this location. This has been informed by consultation with the EA as well as further site-specific hydraulic modelling as described in the FRA and Drainage Strategy and its appendices;
- consideration of the hydro-morphological conditions of watercourses, where applicable; and

- review of soil, geological and hydrogeological information as described in more detail in PEIR Chapter 15: *Geology, soils and contamination land*.

14.31. The advice entitled *Flood Risk Assessments: Climate Change Allowances* (Environment Agency, 2016, updated 2021) has been used to determine the potential future baseline in terms of fluvial flood risk. This guidance has also been used to inform the surface water drainage designs.

Flood risk assessment

14.32. The hydraulic analysis of the Main HNRFI Site was agreed with the EA and LCC as the main LLFA. Hydraulic modelling reports are provided as appendices to the FRA and Drainage Strategy.

14.33. To assess future flood risks, the hydraulic modelling has made an allowance for climate change of 30% on top of the 100-year river flow.

Identifying likely significant effects

14.34. The assessment of potential effects of the Proposed Development on surface water and flood risk considers the following:

- contamination arising from construction drainage;
- fluvial flood risk, both in terms of impacts to the Proposed Development and changes to flood risk in the surroundings or to downstream receptors as a result of the Proposed Development;
- changes to the surface water runoff regime and associated downstream flood risks;
- the effects of regular discharge of surface water, during operational use, on the water quality of downstream receiving waterbodies; and
- potential impacts on the demand of the local potable water network and on foul drainage infrastructure.

Demolition and construction

14.35. The identification of potential significant effects during the demolition and construction phase is based on a review of the presence of potential receptors, a qualitative assessment of the sensitivity of the receptor and an assessment of the potential pathways for impact and magnitude of likely change.

14.36. The assessment of potential impacts and likely effects has, therefore, comprised the following approach:

- identification and establishment of the sensitivity of water resource receptors on the basis of their use, proximity to the Proposed Development, existing quality or resource value;

- consideration of potential 'contaminant-pathway-receptor' linkages;
- evaluation of the magnitude of potential changes in water quality and hydrology as a result of the introduction of the Proposed Development;
- consideration of mitigation measures integral to the Proposed Development;
- classification of the significance of likely effects; and
- identification and communication of additional mitigation measures to eliminate or reduce residual effects, where considered necessary.

Operational development

14.37. The same methodology is applied to the identification of potential significant effects during the operational phase. This is also informed by hydraulic modelling (see Appendix 14.1 for more details and results), undertaken in order to more accurately assess the flood risk and to inform the design of the Proposed Development, and associated mitigation strategies, in order to minimise any increase in flood risk to both off-site receptors and to the Proposed Development itself and its potential occupants.

Determining effect significance

14.38. The significance of potential effects arising from the Proposed Development have been established through a combination of identifying receptor sensitivity and determining the magnitude of potential effects.

14.39. The assessment has considered the construction and operational stages of the Proposed Development over its lifetime, i.e., taking account of the potential influence of climate change on the surface water and flood risk receptors under consideration.

14.40. The sensitivity of the resource was assessed according to the definitions of receptor sensitivity in Table 14.2 using best practice methodologies and considers the quality, rarity and sensitivity of the resource changing.

14.41. Impacts have been described as beneficial or adverse, and the potential magnitude of this impact rated from major to negligible / no change (Table 14.3). The significance was defined using a matrix of the sensitivity and the magnitude of the impact according to Table 14.4. The tables have been based on the published assessment criteria set out in the DMRB guidance.

Table 14.2: Definition of receptor sensitivity

Value / Sensitivity	Criteria	Examples
High	Water environment features with a very high yield, quality	Conditions supporting sites with international conservation designations (Special Areas of

Value / Sensitivity	Criteria	Examples
	or rarity with little potential for substitution. Water resources supporting human health and economic activity at a regional scale. Features with a very high vulnerability to flooding.	Conservation, Special Protection Area, Ramsar Site) where the designation is based specifically on the water features. Groundwater resource in Zone 1 of a Source Protection Zone (SPZ). Principal aquifer providing regionally important resource or supporting a site protected under EC or UK habitat legislation/species protected by EC or UK legislation. Surface water WFD class 'High'. Land use types defined as 'Essential Infrastructure' and 'Highly Vulnerable' in the National Planning Policy Framework (NPPF) flood risk vulnerability classification.
Medium	Water environment features with a high yield, quality or rarity with a limited potential for substitution. Water resources supporting human health and economic activity at a local scale. Features with a high vulnerability to flooding.	Conditions supporting sites with international conservation designations (Site of Special Scientific Interest (SSSI), National Nature Reserve) where the designation is based specifically on the water features. Species protected under EC or UK habitat legislation. Principal aquifer providing a locally important resource, Groundwater resource in Zone 2 of an SPZ. Surface water WFD class 'Good'. Land use types defined as 'More Vulnerable' in the NPPF flood risk vulnerability classification.
Low	Features with a moderate or low yield, quality or rarity with some or good potential for substitution. Water resources supporting human health and economic activity at household/individual business scale. Water resources that do not support human health and are of only limited economic benefit.	Sites with local conservation designations (Local Nature Reserves (LNR), County Wildlife Sites) where the designation is based specifically on the water features. Non-reportable or heavily modified WFD river waterbodies. Groundwater outside SPZ. Surface water WFD class 'Moderate' or 'Poor'. Land use types defined as 'Less Vulnerable' or 'Water-compatible' in the NPPF flood risk vulnerability classification.

Table 14.3: Definition of water environment magnitude of change

Magnitude	Criteria	Examples
Major (Adverse)	Loss of attribute and/or quality and integrity of the attribute.	Increase in peak flood level (>100mm). Loss of a fishery. Deterioration in surface water ecological or chemical WFD element.
Moderate (Adverse)	Results in effect on integrity of attribute, or loss of part of attribute.	Increase in peak flood level (>50mm). Partial loss of a fishery. Measurable decrease in surface water ecological or chemical WFD quality or flow with potential for deterioration in WFD element status.
Minor (Adverse)	Results in some measurable change in attributes, quality or vulnerability.	Increase in peak flood level (>10mm). Measurable decrease in surface water ecological or chemical WFD quality or flow.
Negligible (Neutral / Not Significant)	Results in effect on attribute, but of insufficient magnitude to affect the use or integrity.	Negligible change in peak flood level (< +/-10mm). Discharges to watercourse which lead to no change in the feature's integrity.
Minor (Beneficial)	Results in some beneficial effect on attribute or a reduced risk of negative effect occurring.	Creation of additional flood storage and decrease in peak flood level (>10mm). Measurable increase in surface water ecological or chemical quality.
Moderate (Beneficial)	Results in a moderate improvement of attribute quality.	Creation of additional flood storage and decrease in peak flood level (>50mm). Measurable increase in surface water ecological or chemical quality or flow with potential for WFD element status to be improved.
Major (Beneficial)	Results in a major improvement of attribute quality or creation of new feature.	Creation of additional flood storage and decrease in peak flood level (>100mm). Increase in productivity or size of fishery. Improvement in surface water

Magnitude	Criteria	Examples
		ecological or chemical WFD element.

Table 14.4: Determination of significant effects for the water environment

Magnitude	Receptor Value / Sensitivity		
	High	Medium	Low
Major	Major	Major	Moderate
Moderate	Major	Moderate	Minor
Minor	Moderate	Minor	Negligible
Negligible	Minor	Negligible	Negligible

14.42. For the purpose of undertaking the assessment in accordance with the Infrastructure EIA Regulations 2017, effects determined to be moderate or greater are considered significant in EIA terms.

Duration of effect

14.43. Identified impacts can have differing durations. These have been defined as:

- *Short-term (temporary):* Temporary effects related to a specific construction event of no more than a year's duration – such as the construction of an individual building or a specific element of infrastructure such as a section of road.
- *Medium-term (temporary and permanent):* This is covers the 10-year construction phase, where some elements of the development are operational whilst others are still under construction.
- *Long-term (permanent):* Permanent effects arising from the operation of the HNRFI or from the permanent presence or removal of physical features.

RELEVANT LAW, POLICY AND GUIDANCE

14.44. The following summarises planning and environmental legislation, policies and guidance which are considered relevant to water resources in relation to the Proposed Development, and accordingly have been referenced and consulted in the preparation of this PEIR chapter.

The Water Resources Act (1991)

14.45. The Water Resources Act[1] relates to the control of the water environment. The main

[1] The Water Resources Act 1991 (Amendment) (England and Wales) Regulations 2009

aspects of the Act which are relevant to the Proposed Development include provisions concerning land drainage, flood mitigation and controlling discharges to watercourses to prevent water pollution. It also outlines the functions and responsibility of the EA in regulating the water environment.

Flood and Water Management Act (2010)

14.46. The Flood and Water Management Act[2] takes forward some proposals from the UK government's report *Future Water, Making Space for Water* and the government's Response to Sir Michael Pitt's Review of the summer 2007 floods.

14.47. The Act gives the EA the strategic overview of management of flood risk in England. It gives upper tier local authorities in England responsibility for preparing and putting in place strategies for managing flood risk from groundwater, surface water and ordinary watercourses in their areas.

14.48. Local flood authorities, district councils, internal drainage boards and highways authorities have a duty to aim to contribute towards sustainable development.

National Policy Statement for National Networks (2014)

14.49. The Department of Transport National Policy Statement for National Networks[3] sets out the need for, and Government policies for, nationally significant infrastructure rail and road projects for England.

14.50. Paragraphs 5.90-5.115 (related to flood risk) and 5.219-5.231 (related to water quality and resources) include the requirements to:

- *'take into account the potential impacts of climate change'*;
- ensure that *'potential releases can be adequately regulated under the pollution control framework' and 'the effects of existing sources of pollution in and around the project are not such that the cumulative effects of pollution when the proposed development is added would make that development unacceptable'*;
- undertake an appropriate assessment of flood risk, in accordance with the requirements of the 'National Planning Policy Framework' in order to *'avoid, limit and reduce the risk of flooding to the proposed infrastructure and others*'; and
- assess potential impacts on water quality, water resources, physical characteristics of the water environment, and water bodies or protected areas under the Water Framework Directive.

[2] Flood and Water Management Act (2010)
[3] National Policy Statement for National Networks, Department for Transport (December 2014)

National Planning Policy Framework (2021)

14.51. The NPPF[4] sets out the Government's national policies on different aspects of land use planning, including flood risk. It must be taken into account in the preparation of local plans and is a material consideration in planning decisions.

14.52. The NPPF requires development to be located in areas of lower flood risk where possible and stresses the importance of preventing increases in flood risk to the wider catchment.

14.53. The NPPF sets out a sequential, risk-based approach to the location of development, taking into account all sources of flood risk and the current and future impacts of climate change, so as to avoid, where possible, flood risk to people and property.

14.54. The NPPF is accompanied by National Planning Practice Guidance (PPG)[5]. The PPG relevant to surface water and flood risk is *Flood Risk and Coastal Change,* which sets out the vulnerability and suitability of different land uses to flood risk. The PPG also sets out how the Sequential and Exception tests should be applied to the location of development.

CIRIA Document C753: The SuDS Manual

14.55. The CIRIA SuDS Manual[6] provides guidance regarding planning, design, construction and maintenance of Sustainable Drainage Systems (SuDS) to assist with the effective implementation within both new and existing developments.

Design Manual for Roads and Bridges HD 45/09 (Road Drainage and the Water Environment) (2009)

14.56. The Highways Agency's Design Manual for Roads and Bridges[7] gives guidance on the assessment and management of the impacts that road projects may have on the water environment. These include possible impacts on the quality of water bodies and on the existing hydrology of the catchment(s) through which roads pass. The Standard may also be applied to existing roads, where appropriate.

Water Framework Directive (2000)

14.57. The Water Framework Directive (WFD)[8] is an important mechanism for assessing and managing the water environment in the European Union (EU), through a six-yearly cycle of planning and implementing measures to protect and improve the water environment. Since the UK left the EU, the EU Water Framework Directive has been revoked and replaced in England and Wales by the Water Environment (Water Framework Directive)

[4] National Planning Policy Framework, Ministry of Housing, Communities and Local Government (2021)
[5] National Planning Practice Guidance: Flood Risk and Coastal Change, Ministry of Housing, Communities and Local Government (2014)
[6] CIRIA C753 The SuDS Manual, B. Woods Ballard, S. Wilson, H. Udale-Clarke, S. Illman, T. Scott, R. Ashley. R. Kellagher (2015)
[7] Design Manual for Roads and Bridges HD 45/09 Road Drainage and the Water Environment. The Highways Agency (November 2009)
[8] Directive 2000/60/EC of the European Parliament and of the Council of 23 October 2000 establishing a framework for Community action in the field of water policy

(England and Wales) Regulations 2017[9].

14.58. The assessment and protection of waterbodies is undertaken by implementing River Basin Management Plans. In general terms, there is an onus on developers to protect and, if possible, enhance waterbodies close to proposed developments. Eleven River Basin Districts have been identified in England and Wales, of which the Study Area falls within the Humber River Basin District. The Regulations include a requirement for surface water bodies to achieve 'good' status with respect to ecology and water chemistry by 2021. Progress is monitored by the EA in its role as the 'competent authority'. The current plan relevant to the Study Area is the Humber River Basin District River Basin Management Plan 2015 - 2021.

LCC Preliminary Flood Risk Assessments (2011)

14.59. The LCC Preliminary Flood Risk Assessment (PFRA)[10] is an assessment, undertaken by LCC, of floods that have taken place in the past and floods that could take place in the future. It generally considers flooding from surface water runoff, groundwater and ordinary watercourses, and is prepared by a LLFA. The PFRA seeks to assess past and future flood risk and identify areas at significant flood risk.

WCC Preliminary Flood Risk Assessment (2017)

14.60. The WCC PFRA[11] is an assessment, undertaken by WCC, of floods that have taken place in the past and floods that could take place in the future. It generally considers flooding from surface water runoff, groundwater and ordinary watercourses, and is prepared by a LLFA. The PFRA seeks to assess past and future flood risk and identify areas at significant flood risk. The PFRA was completed in May 2011 and subsequently reviewed in June 2017[12].

LCC Local Flood Risk Management Strategy (2015)

14.61. The LCC Local Flood Risk Management Strategy (LFRMS)[13] was prepared by LCC to help understand and manage flood risk at a local level. The LFRMS aims to ensure that the knowledge of local flood risk issues is communicated effectively so floods can be better managed. The LFRMS also aims to promote sustainable development and environmental protection.

WCC Local Flood Risk Management Strategy (2016)

14.62. The WCC LFRMS[14] was prepared by WCC to help understand and manage flood risk at a local level. The LFRMS aims to ensure that the knowledge of local flood risk issues is communicated effectively so floods can be better managed. The LFRMS also aims to

[9] UK Statutory Instruments: 2017 No. 4.7: The Water Environment (Water Framework Directive) (England and Wales) Regulations 2017
[10] Preliminary Flood Risk Assessment, Leicestershire County Council (2011)
[11] Preliminary Flood Risk Assessment, Warwickshire County Council (2011)
[12] Preliminary Flood Risk Assessment Review, Warwickshire County Council (2017)
[13] Local Flood Risk Management Strategy, Leicestershire County Council (2015)
[14] Local Flood Risk Management Strategy, Warwickshire County Council (2016)

promote sustainable development and environmental protection.

Interim LLFA Guidance Note: Planning and Development in Leicestershire (2018)

14.63. The LCC LLFA Guidance Note[15] serves as interim LLFA surface water and flood risk guidance prior to completion of more comprehensive guidance. It aims to enable the design and evaluation of SuDS to meet agreed standards and ensure SuDS are maintainable now and in the future.

Leicester City and Leicestershire Strategic Water Cycle Study (2017)

14.64. The Leicester City and Leicestershire Strategic Water Cycle Study[16] considered the cumulative impact of the anticipated overall level of growth within Leicestershire to 2050 on the provision of a clean water supply, the safe disposal of wastewater and protection from flooding. It has considered the implications of development in the potential growth areas to assess if large-scale development within these areas would be viable and sustainable in terms of impacts on the 'water cycle'.

Hinckley and Bosworth Borough, Blaby District and Oadby and Wigston Borough Joint Strategic Flood Risk Assessment (2014)

14.65. A SFRA is a study carried out by one or more local planning authorities to assess the risk to an area from flooding from all sources, now and in the future.

14.66. The Hinckley and Bosworth Borough, Blaby District and Oadby and Wigston Borough Joint SFRA[17]. aims to provide an assessment of flood risk from all sources within the three local authority areas. An addendum to the SFRA was published in 2017 which updated the 2014 SFRA based on latest information and guidance.

Leicestershire and Leicester City-wide SFRA (2017)

14.67. The LCC and Leicester City-wide SFRA[18] is a joint SFRA for all local authorities within Leicestershire and Leicester City undertaken to support the Leicestershire Strategic Growth Plan.

HBBC SFRA (2019 and 2020)

14.68. HBBC has published an update to the Joint SFRA and the Leicestershire and Leicester City SFRA. Whereas the two previous documents covered multiple local authority areas, the update covered the Hinckley and Bosworth area only and is presented in two parts: a Level

[15] LLFA Guidance Note: Planning and Development in Leicestershire, Leicestershire County Council (November 2018)
[16] Strategic Water Cycle Study, Leicester City and Leicestershire County Council (2017)
[17] Joint Strategic Flood Risk Assessment, Hinckley and Bosworth Borough, Blaby District, and Oadby and Wigston Borough Councils (2014)
[18] Leicestershire and Leicester City Level 1 Strategic Flood Risk Assessment (Leicestershire Local Planning Authorities and Leicester City Council (2017)

1 SFRA completed in 2019[19] and a Level 2 SFRA completed in 2020[20].

Blaby District Local Plan (2013)

14.69. The Blaby Local Plan (Core Strategy) [21], prepared by BDC, sets out the vision, objectives, strategy and core policies for the spatial planning of the District up to 2029. The key relevant policies from the Local Plan in relation to water resources and flood risk, comprise of CS21 (Climate Change) and CS22 (Flood Risk Management).

14.70. Amongst other aims, these policies require proposed developments to:

- Minimise the risk of flooding to property, infrastructure and people.
- Minimise vulnerability and provide resilience to climate change and flooding by including adaptations such as appropriate shading and planting, green roofs, SUDS, rain water harvesting and storage, and grey water recycling.
- Be preferentially located in areas at lowest risk of flooding within the District.
- Manage surface water run-off to minimise the net increase in the amount of surface water discharged.

14.71. The Blaby District Local Plan (Delivery) Development Plan Document (DPD)[22] was adopted in February 2019. The Delivery DPD includes site allocations and development management policies and sites alongside the adopted Core Strategy.

Hinckley and Bosworth Local Plan 2006-2026 (2009)

14.72. The Hinckley and Bosworth Local Plan 2006-2026 outlines HBBC's policies for development within the Borough. The Local Plan is made up of a series of documents, of which the Core Strategy Development Plan Document (DPD)[23] provides the vision and spatial strategy for the borough. The Core Strategy was adopted in December 2009 and sets out, that whilst flooding is not a major issue for the borough, flood mitigation measures, such as sustainable urban drainage, will need to be incorporated into new developments.

14.73. Another document, Site Allocations and Development Management Policies DPD[24], adopted in July 2016, includes Policy DM7 'Preventing Pollution and Flooding' sets out that

[19] Strategic Flood Risk Assessment for Hinckley and Bosworth Borough Council: Final Report, Hinckley and Bosworth Council (July 2019)
[20] Hinckley and Bosworth Borough Council Level 2 Strategic Flood Risk Assessment: Final Report, Hinckley and Bosworth Borough Council (May 2020)
[21] Blaby District Local Plan: Local Plan (Core Strategy) Development Plan Document, Blaby District Council (February 2013)
[22] Blaby District Local Plan: Local Plan (Delivery) Development Plan Document, Blaby District Council (February 2019)
[23] Local Plan 2006 – 2026 Adopted Core Strategy, Hinckley and Bosworth Borough Council (December 2009)
[24] Local Plan 2006 – 2026 Site Allocations and Development Management Policies DPD, Hinckley and Bosworth Borough Council (July 2016)

adverse impacts from pollution and flooding will be prevented by:

- ensuring development proposals will not adversely impact the water quality, ecological value or drainage function of water bodies in the borough.
- Appropriate containment solutions for oils fuels and chemicals are provided.
- The development does not create or exacerbate flooding by being located away from areas of flood risk unless adequately mitigated against in line with National Policy.

14.74. HBBC are currently developing a new Local Plan which will set out land allocations and planning policies for the period 2020 to 2039

Rugby Local Plan 2011-2031 (2019)

14.75. The Rugby Local Plan 2011-2031[25] outlines Rugby Borough Council's strategic policies and detailed development management policies. The key relevant policy from the Local Plan in relation to water resources and flood risk, comprise of SDC5: Flood Risk Management. Amongst other aims, this policy requires proposed developments to apply the sequential approach to the location of development, with development steered to areas with the lowest probability of flooding. SDC5 also sets out how applicants will need to demonstrate compliance with the policy by way of a site-specific FRA.

Harborough Local Plan 2011-2031 (2019)

14.76. The Harborough Local Plan 2011-2031[26] sets out the vision, objectives, spatial strategy and planning policies for the Harborough district. The key relevant policies from the Local Plan in relation to water resources and flood risk, comprise of CC3: Managing Flood Risk and CC4 Sustainable Drainage. Amongst other aims, these policies require new development to take place in areas of lowest risk of flooding, including the potential future risk from climate change. They also set out how development should be subject to a site-specific FRA, where required, and that all major development must incorporate sustainable drainage systems.

Humber River Basin Management Plan (2015)

14.77. The latest version of the Humber River Basin Management Plan (RBMP)[27], undertaken by Defra and the EA, includes an assessment of river basin characteristics, a review of the impact of human activities, statuses of water bodies and an economic analysis of water use and progress since the first plan was published in 2009.

Severn Trent Water: Water Resources Management Plan (2019)

14.78. The Water Resource Management Plan, prepared by Severn Trent Water[28], is a long-term

[25] Local Plan 2011 – 2031, Rugby Borough Council (June 2019)
[26] Local Plan 2011 – 2031, Harborough District Council (April 2019)
[27] Humber River Basin District River Basin Management Plan, Defra and Environment Agency (2015)
[28] Water Resource Management Plan, Severn Trent Water (August 2019)

assessment of the likely demand and supply of potable water within the STW supply region. The document also includes an outline of plans in order to balance supply and demand, whilst meeting environmental obligations and climate change uncertainty.

BASELINE CONDITIONS

14.79. The following outlines the existing water resource conditions within the Study Area.

Hydrology

14.80. The majority of the Proposed Development is located in the Thurlaston Brook catchment. An unnamed tributary of the Thurlaston Brook, which is referred to here as the 'Thurlaston Brook Tributary'', flows eastwards across the route of the proposed A47 Link Road and immediately beyond the railway line to the north of the Main HNRFI Site.

14.81. An Unnamed Ordinary Watercourse (UOW) flows north-eastward through the southern portion of the Main HNRFI Site before joining the Thurlaston Brook Tributary just downstream of the railway line. This UOW 'issues' within the Main HNRFI Site itself, rather than being fed by an upstream catchment.

14.82. Additionally, several field drainages ditches and small ponds in the Main HNRFI Site discharge into the Thurlaston Brook Tributary.

14.83. The Thurlaston Brook catchment has a WFD overall water body quality classification of 'Poor' (2019), with an ecological status of 'Poor' and a 'Fail' chemical status. The catchment has an objective of achieving 'Good' overall status by 2027. Agricultural and rural land management, and pollution from waste water are the main issues preventing waters reaching good status. The Soar from Source to Soar Brook catchment has a WFD overall water body classification of 'Moderate' (2019), with an ecological status of 'Moderate' and a 'Fail' chemical status. The catchment has an objective of achieving 'Good' overall status by 2027. Agricultural and rural land management is the main issues preventing waters reaching good status.

14.84. The underlying aquifer (Carmarthen Soar – Secondary Combined) has a WFD classification of 'Good' (2019).

Flood risk

Fluvial

14.85. With reference to the EA's *Flood Map for Planning* (Figure 14.2), the majority of the DCO Site lies within Flood Zone 1 (low probability of flooding). Flood Zone 1 is defined in the NPPF as land having a less than 1 in 1,000 annual probability of fluvial or tidal flooding. However, Figure 14.2 shows a small portion of the Main HNRFI Site adjacent to the northern boundary is located in Flood Zone 3 (high probability of flooding) and Flood Zone 2 (medium probability of flooding). Flood Zone 3 is defined in the NPPF as land having a 1

in 100 or greater annual probability of fluvial flooding, or a 1 in 200 or greater annual probability of tidal flooding. Flood Zone 2 is defined as land having between a 1 in 100 and 1 in 1,000 annual probability of fluvial flooding, or between a 1 in 200 and 1 in 1,000 annual probability of tidal flooding. This flood risk is associated with the Thurlaston Brook Tributary.

14.86. The *Flood Map for Planning* does not take account of watercourses with a catchment area of less than 3km^2, which is the case of the smaller watercourses within the Main HNRFI Site and in the vicinity of the A47 Link Road and off-site junction enhancements and highway works. As such, the *Flood Map for Planning* is not considered fully representative of flood risk in these areas.

14.87. The *Flood Map for Planning* shows the A47 Link Road will cross through areas of Flood Zone 2 and Flood Zone 3 associated with the Thurlaston Brook Tributary.

14.88. The FRA and Drainage Strategy includes an assessment of the fluvial flood risk to those junction enhancements and minor off-site works where physical changes to the roads may be required. This is summarised in Table 14.5 below. Of the proposed improvements, only one, 'B6', has the potential to effect surface water and flood risk. The remaining works are located away from watercourses.

Table 14.5: Junction Enhancements and Off-site works – Fluvial Flood Risk

Off-site works	Flood zone category
Junction of B581 Station Road / New Road and Hinckley Road, Stoney Stanton ('B1'), Junction of B4669 Hinckley Road and Stanton Lane, west of Sapcote ('B2'), B4669 Hinckley Road/ Leicester Road, Sapcote ('B4') Stanton Lane / Hinckley Road, south-west of Stoney Stanton ('B3') Junction of B4114 Coventry Road and B581 Broughton Road at Soar Mill, south-east of Stoney Stanton ('B5'), Junction of B4114 Coventry Road and Croft Road, south-west of Narborough ('B6'), Junction of A47 Normandy Way and A447 Ashby Road, Hinckley ('HB1') Junction of A47 Normandy Way / Leicester Road, the B4668 Leicester Road and The Common, south-east of Barwell ('HB2'), Junction of B4668 and New A47 Link Road, north east of the site access (Access Infrastructure) ('HB3') Cross in Hand roundabout at the junction of the A5 Watling Street, A4303 Coventry Road, B4428 Lutterworth Road and Coal Pit Lane, west of Lutterworth ('H1') Proposed Slip Roads on the A47 link and M69 (north and southbound), M69 signage Junction 1 to Junction 2.	Flood Zone 1
Junction of B4114 Coventry Road and Croft Road, south-west of Narborough ('B6')	Flood Zone 3

(Numbers in brackets refer to the DCO reference as set-out in Table 3.2, Chapter 3)

14.89. Modelling of the Thurlaston Brook Tributary and other key watercourses and ditches inside the Main HNRFI Site has been undertaken to understand any flooding issues associated with these waterbodies. The baseline modelling includes the current day scenario as well as risk associated with climate change. The model and its results are included in the FRA and Drainage Strategy. The FRA and Drainage Strategy concludes that the majority of the land inside the Main HNRFI Site is located outside of the floodplain and is at low risk of flooding. However, there are a few localised areas upstream of the railway line where water can pond, as well as an overland flow route near Burbage Common.

14.90. This PEIR chapter has utilised the hydraulic modelling and is accompanied by an FRA and Drainage Strategy which assesses the floodplain and flood risk from all sources in more

detail. The FRA and Drainage Strategy has been submitted in support of the PEIR.

Surface water

14.91. Figure 14.3 of this PEIR Chapter shows the EA's Flood Risk from Surface Water Map for the DCO Site. This shows the potential flooding which could occur when rainwater does not drain away through the normal drainage systems or soak into the ground.

14.92. The mapping identifies the Main HNRFI Site to be predominantly at very low risk of flooding from pluvial sources, with some areas of higher risk associated with the watercourses on the Main HNRFI Site. The pluvial flood risk to the A47 Link Road corridor and the various junction enhancements range from very low to high.

14.93. The FRA and Drainage Strategy includes an assessment of the surface water flood risk to those junction enhancements and minor off-site works where physical changes to the roads may be required. This is summarised in Table 14.6 below. Of the proposed improvements, only one (Junction of A47 Normandy Way / Leicester Road, the B4668 Leicester Road and The Common, south-east of Barwell) has the potential to affect surface water and flood risk. The remaining works are either located away from surface water bodies and / or involve minor works such as introduction of traffic lights.

Table 14.6: Junction Enhancements and Minor Off-site works – Surface Water Flood Risk

Off-site works	Surface Water Risk Category
Normandy Way and Ashby Road A47, Junction of B581 Station Road / New Road and Hinckley Road, Stoney Stanton, Junction of B4114 Coventry Road and B581 Broughton Road at Soar Mill, south-east of Stoney Stanton, Junction of A47 Normandy Way / Leicester Road, the B4668 Leicester Road and The Common, south-east of Barwell, Cross in Hand roundabout at the junction of the A5 Watling Street, A4303 Coventry Road, B4428 Lutterworth Road and Coal Pit Lane, west of Lutterworth, Junction of B4114 Coventry Road and Croft Road, south-west of Narborough, Junction of B4668 and New A47 Link Road, north east of the site access (Access Infrastructure), Proposed Slip Roads on the A47 link and M69 (north and southbound), M69 signage Junction 1 to Junction 2.	Low
Junction of B4669 Hinckley Road and Stanton Lane, west of Sapcote	Medium
Junction of A47 Normandy Way / Leicester Road, the B4668 Leicester Road and The Common, south-east of Barwell, B4669 Hinckley Road/ Leicester Road, Sapcote,	High

Canals and reservoirs

14.94. The nearest canal to the Main HNRFI Site is the Ashby Canal, located over 5km to the west. This distance and the intervening topography is such that the HNRFI is not considered to be at risk from flooding from the canal.

14.95. The off-site works are located away from any canals and are not considered to be at risk from canal flooding.

14.96. Based on EA reservoir inundation mapping, the DCO Site is located entirely outside the area predicted to be at risk in the event of a reservoir failure.

Groundwater

14.97. The FRA and Drainage Strategy concludes that the Main HNRFI Site is underlain predominantly by glacial deposits of the Thrussington Member and Bosworth Clay Member. Localised deposits of Alluvium and the Wolston Sand & Gravel are mapped at

the Main HNRFI Site. The bedrock at the Main HNRFI Site is indicated to comprise Mercia Mudstone.

14.98. The EA classifies the Alluvium and the Wolston Sand and Gravel as Secondary A Aquifers, the Bosworth Clay Member as unproductive strata, the Thrussington Member as an undifferentiated Secondary Aquifer, and the Mercia Mudstone and Edwalton Member Mudstone are categorised as a Secondary B Aquifer.

14.99. The FRA and Drainage Strategy describes that preliminary exploratory site investigations reported that groundwater was encountered in the Main HNRFI Site in four exploratory positions during fieldwork between 3.10m below ground level (bgl) and 3.90m bgl.

14.100. The FRA and Drainage Strategy also concludes that the off-site works are at low risk of groundwater flooding.

14.101. The conclusion from the FRA and Drainage Strategy is the DCO Site is at low risk of groundwater flooding due to the depth of groundwater and the low permeability of the underlying strata.

Drainage

14.102. The Main HNRFI Site does not appear to be served by any existing drainage infrastructure. Rainfall is believed to infiltrate into the ground where geological and hydrogeological conditions allow, and then to runoff at surface level once the infiltration capacity of the ground has been exceeded. Any run-off currently generated will likely be directed to local surface water bodies, and ultimately into the Thurlaston Brook or the River Soar.

14.103. The off-site works are to existing highways and are, therefore, served by existing drainage.

Foul water

14.104. The Main HNRFI Site is located within STW's sewerage area, although it is not believed to currently be served by a public foul water drainage system. Foul water from existing properties within the Main HNRFI Site is understood to currently be disposed to on-site management / disposal systems.

14.105. The nearest public foul water sewer connection point to the Main HNRFI Site is a 150mm diameter sewer to the north-east of the nearest part of the Main HNRFI Site. This connects downstream to the Elmesthorpe – Bostock Close Sewage Pumping Station (SPS) and Elmesthorpe – Bostock Close Combined Sewer Overflow (CSO). The SPS pumps foul water to the Wastewater Treatment Works (WwTW) at Stoney Stanton, approximately 3.0km to the east of the Main HNRFI Site. The WwTW discharges treated water to the River Soar, within whose immediate downstream catchment no designated sites of ecological importance were identified, nor any Drinking Water Protected Areas (Surface Water) or Drinking Water Safeguard Zones (Surface Water).

14.106. Consultation with STW highlighted that it had undertaken modelling of the Proposed Development in the past, the results of which demonstrated insufficient capacity at the SPS from additional foul flows. As such, an upgrade to the network will be required.

14.107. The proposed A47 Link Road, junction enhancements and minor off-site works do not affect any foul water drainage assets.

Potable water supply

14.108. The EA classifies the STW region as having a 'moderate' degree of water stress.

14.109. Potable water is supplied to the area by STW. STW has confirmed that there is a 300 mm trunk main to the northeast of the Main HNRFI Site, running along the B4668. STW confirmed that it can supply the development from this existing trunk main.

14.110. The proposed A47 Link Road, junction enhancements and minor off-site works do not affect any water supply assets.

Designations

14.111. Burbage Wood and Ashton Firs, located immediately adjacent to the south-west of the Main HNRFI Site, are designated as a SSSI and LNR, on the basis of biological interest. However, the topography of the area is such that land in the Main HNRFI Site slopes, and watercourses flow, away from the SSSI; therefore, surface water and drainage is not expected to have any significant effect on the SSSI.

14.112. There are no other SSSIs within 1km of the DCO Site.

14.113. No designated sites of ecological importance were identified in the DCO Site, nor any Drinking Water Protected Areas (Surface Water) or Drinking Water Safeguard Zones (Surface Water).

14.114. None of the DCO Site is located in a Groundwater Source Protection Zone. There are no active abstraction licences listed within 1km of the Main HNRFI Site and there are no discharge consents listed as issuing to groundwater at the Main HNRFI Site or in the surrounding area.

Future baseline

14.115. Climate change will lead to increased rainfall intensity and flows within watercourses which may subsequently increase flood risk both within the DCO Site and further downstream. The potential impact of climate change has been considered as part of the FRA and Drainage Strategy.

14.116. By the time the Proposed Development is complete (projected to be in 2036) it is assumed that the committed development listed in Chapter 20: *Cumulative and transboundary effects* of this PEIR will be in place. However, it is not anticipated that the Proposed Development would have any significant impact upon flood risk, surface water quality and quantity, and foul water. As per the NPPF, PPG and Non-Statutory Technical

Standards for Sustainable Drainage requires all new developments are upheld to the same standards, so as to not increase risk to third parties and, where possible, make provision for betterment.

Summary of receptors and sensitivity

14.117. The potential receptors and their sensitivity in terms of groundwater, surface water, flood risk and drainage are described below in Table 14.7. Those receptors identified remain valid for both the existing and future situation.

Table 14.7: Potential sensitivity of receptors

Receptor	Type of Impact	Sensitivity (Value)	Reason for Sensitivity
Thurlaston Brook Tributary	Water Quality	Low	Overall Poor WFD Status
	Flood Risk	High	Flood Zone 1, 2 and 3
UOW	Water Quality	Low	Overall Poor WFD Status
	Flood Risk	High	Flood Zone 1, 2 and 3
Soar Brook	Water Quality	Low	Overall Moderate WFD Status
	Flood Risk	High	Flood Zone 1, 2 and 3
Minor Watercourses	Water Quality	Low	Overall Poor WFD Status
	Flood Risk	High	Flood Zone 1, 2 and 3
Groundwater	Water Quality	Low	Minor Aquifer
	Underlying Aquifer	Medium	Good WFD Status
Construction Workers	Flood Risk	High	Human Life
STW Public Sewer Network	Flood Risk / Resource availability	Medium	Existing residential, commercial or retail property.
STW Potable Water Network	Resource availability	Low	Development can be supplied by existing Trunk Main.

POTENTIAL SIGNIFICANT ENVIRONMENTAL EFFECTS OF THE PROPOSALS

14.118. This section provides an assessment of the potential significant environmental impacts of the Proposed Development on the basis that no mitigation measures are in place. As such the impacts might appear extreme. In the medium term the construction stage may

overlap with the operational stage; as such the effects from both stages outlined below may occur. The assessment covers the worst-case effects of both construction and operational stages. As such, any medium term overlap of construction and operational stage is encompassed within these worst case scenarios and is not expected to result in effects more significant than those outlined below. Mitigation measures to address these potential impacts are outlined in the sections below.

Construction stage

14.119. The effects associated with the construction phase of the Proposed Development are considered to be direct, temporary and short to medium term duration. The effects, prior to mitigation are outlined below.

Flood risk

14.120. The majority of the DCO Site is located within Flood Zone 1. However, there are some small areas of the Main HNRFI Site and off site highway work 'B6' within Flood Zone 2 and 3. Therefore, the effect of flood risk (*major magnitude)* in these areas on construction workers (*high sensitivity receptor*) is considered to be major adverse**,** prior to mitigation.

14.121. The following construction activities within the DCO Site could potentially increase flood risk within the Study Area and downstream catchments, prior to mitigation:

- Construction works could compromise the 'normal' functioning of existing watercourses, through altering channel geometry, and hence altering flow characteristics and / or routes.

- The mounding of materials and placement of other structures within areas identified as being at risk of flooding could result in a loss of floodplain storage and / or the alteration of overland flow characteristics and / or routes.

14.122. Small portions of the Main HNRFI Site, and off site highway work 'B6', as well as downstream catchments are designated as Flood Zone 2 and 3 (*high sensitivity receptor*). As such the significance of the effect of an increase in flood risk (*major magnitude)* to the site or downstream catchments is considered major adverse**,** prior to mitigation.

Surface water quantity

14.123. The use of heavy machinery on the DCO Site during the construction phase is likely to result in short term disruption to the rate of infiltration. The movement of construction traffic could also disturb the upper portions of the ground, leading to compaction, altering the degree of surface water infiltration and runoff. A short-term increase in runoff rates *(minor impact magnitude*) may increase the volume and rate of runoff into minor watercourses (*high sensitivity receptor*). The impact is considered to be moderate adverse. The significance of the effect of a short-term reduction in infiltration (*minor impact magnitude*) to the bedrock aquifer (*low sensitivity resource*) is considered to be negligible.

14.124. The effect of the off-site works 'Junction of A47 Normandy Way / Leicester Road, the B4668 Leicester Road and The Common, south-east of Barwell' is considered negligible considering the short term, minor nature of the proposed works.

Surface water quality

14.125. Construction activities can lead to the pollution of controlled waters. Activities that might generate impacts include the demolition of existing structures, earth stripping, stockpiling, excavation, construction plant movements and hauls, refuelling, equipment maintenance, storage of materials and chemicals and the generation, storage and disposal of waste materials. Impacts are generally from sediment (soil particles) suspended in runoff, particularly from rainfall during storm events, which can affect water quality, or from pollution by construction materials or fuels.

14.126. Suspended solids are one of the most common causes of water pollution from construction sites. They emanate from excavations, exposed ground or stock piles, plant and wheel washing, build-up of dust and mud on roads, or pumping of contaminated surface waters and groundwater accumulated on the Main HNRFI Site. Extreme rainfall events could exacerbate runoff rates and the mobilisation of suspended solids has the potential to affect ecological habitats, block watercourses and alter flow regimes. Additionally, suspended solids from construction work, particularly from intrusive earthworks for foundations and sewers, could create pathways to local groundwater.

14.127. Diversion of the UOW is proposed as part of the Proposed Development. During construction and prior to vegetation colonisation the diversion of the UOW channel through the Main HNRFI Site risks exposing loose sediments to the water environment that could become mobilised under high flow conditions and transported into the downstream fluvial environment.

14.128. Prior to mitigation, the significance of the effect of runoff containing suspended solids (*moderate impact magnitude*) on the Thurlaston Brook Tributary, UOW and minor watercourses UOW (*low sensitivity receptors*) is considered to be minor adverse. It will also have a minor adverse effect on groundwater (*low sensitivity receptor*) within the DCO Site.

14.129. The formation of hydrocarbons has the potential to impact on watercourses and aquatic ecosystems. The significance of the effect of hydrocarbons (*moderate impact magnitude*) on the local watercourses (*low sensitivity receptor*), prior to mitigation, are considered minor adverse.

14.130. The uncontrolled release of substances such as solvents, cleaning agents, paints and other chemicals, liquids or solids could lead to further pollution. These could become a hazard if used in the construction process or stored on the DCO Site. These substances can be of high toxicity (*moderate impact magnitude*), thereby having a minor adverse effect on the Thurlaston Brook Tributary, UOW and minor watercourses, and groundwater (*low sensitivity receptors*) prior to mitigation.

14.131. Concrete production taking place on the DCO Site or introduced by ready-mix lorries

could cause small particulates to settle in the surrounding area. Wastewater from the batching plant or washing down of lorries/mixing areas could cause particulates to runoff into watercourses. Without mitigation, the potential impact of this source of pollutant (*moderate impact magnitude*) on the Thurlaston Brook Tributary, UOW and minor watercourses (*low sensitivity receptors*) is considered a short term minor adverse effect.

14.132. The above impacts on surface water quality as a result of decreased runoff quality and the introduction of machinery, vehicles and substances may also lead to decreased quality of groundwater receptors. Without mitigation, the potential impact of these pollutants (*moderate impact magnitude*) on the underlying aquifer (*medium sensitivity receptor*) is considered moderate adverse.

Foul water

14.133. There will be increased pressure on the local foul water network due to the temporary presence of construction workers and associated welfare facilities. The demand placed upon the existing public sewer network (*medium sensitivity receptor*) for the construction period is considered to be low (*minor impact magnitude*). The significance of the effect is considered minor adverse due to the medium sensitivity of the receptor and minor magnitude of the effect, prior to mitigation.

Potable water supply

14.134. There will be an increased demand on the local water supply because of construction activities and the presence of construction workers. The demand placed upon the water supply network (*low sensitivity receptor*) for the construction periods is considered to be negligible. The significance of the effect is considered negligible due to the low sensitivity of the receptor and negligible magnitude of the effect.

Operational stage

14.135. The effects associated with the operation phase of the Proposed Development are considered to be direct, permanent and medium to long term in length. The effects prior to mitigation are described below.

Flood risk

14.136. The Proposed Development includes the reprofiling of the Main HNRFI Site to form two plateaux. To facilitate the reprofiling, the UOW in the Main HNRFI Site will be realigned to flow along the south-eastern boundary within a new channel. The channel will be designed to convey the necessary flood flows.

14.137. The A47 Link Road crosses a number of small watercourses. The road will be elevated upon an embankment above the floodplain so that it can remain operational during times of flood. Culverts will be provided beneath the road to preserve hydraulic connectivity and convey flood flows into the downstream channels.

14.138. Therefore, the Proposed Development designs have taken account of the need to

balance flood risk by allowing flood water to move through the Main HNRFI Site in such a way that conveyance is not significantly impeded. Hydraulic modelling has been completed to determine the extent and depth of flooding at the Main HNRFI Site and in its surrounds during a 100 year plus climate change (30% increase in flow) event. Therefore, the effect of flood risk on occupants and users of the Main HNRFI Site is considered to be negligible**,** as a result of a negligible magnitude effect on a high sensitivity receptor.

Surface water quantity

14.139. The Main HNRFI Site and the A47 Link Road will introduce a significant area of impermeable surfaces onto a currently greenfield area. This has the potential to increase surface water runoff through reduced infiltration which will increase discharge into receiving watercourses such as the Thurlaston Brook Tributary and UOW (*high sensitivity receptors*). This could cause an increase in flood risk (*moderate impact magnitude*). The impact on the Thurlaston Brook Tributary and UOW is considered to be major adverse, without mitigation.

Surface water quality

14.140. Once in use, pollutants associated with run-off from the Main HNRFI Site and the A47 Link Road have the potential to impact detrimentally upon the quality of water (*moderate impact magnitude*) both in the sewer network (*medium sensitivity receptor*) and the Thurlaston Brook Tributary and UOW (*low sensitivity receptors*) from direct runoff. Contamination in the operational phase is most likely to be caused by vehicle usage. The effect on the sewer network is considered to be moderate adverse, and on the Thurlaston Brook Tributary and UOW is considered to be minor adverse, respectively, without mitigation.

Foul water

14.141. There will be increased foul water flows (*minor impact magnitude*) to the local foul water network (*medium sensitivity receptor)* because of the Proposed Development. STW has confirmed network upgrades will be required because of insufficient capacity at the Elmesthorpe – Bostock Close SPS. The significance of the effect is considered minor adverse due to the medium sensitivity of the receptor and minor magnitude of the effect, prior to mitigation.

Potable water supply

14.142. The increase in water demand as a result of the Proposed Development could lead to an impact on the capacity of the local public water supply. The significance of the effect is considered negligible due to the low sensitivity of the receptor and negligible magnitude of the effect.

Major accidents and disasters

14.143. The main disaster, related to surface water and flood risk, that might affect the Main

HNRFI Site is a significant flooding event. The hydraulic modelling includes an allowance for climate change, including a high impact climate change scenario, which for the Main HNRFI Site is a 60% increase to the 1 in 100-year fluvial event. The results from the modelling have been used to support the Proposed Development and help inform mitigation measures. Therefore, the vulnerability of the Main HNRFI Site to a major disaster or accident, following mitigation, is considered negligible.

14.144. The drainage strategy for the Proposed Development will be designed to consider climate change. Additionally, reduced rates of discharge from the Main HNRFI Site as a result of the drainage strategy may provide downstream benefits in the form of reduced flood risk. As such, the effect of the development on major accidents or disasters is considered negligible, following mitigation.

14.145. Major accidents and disasters are covered in PEIR Chapter 19.

PROPOSED MITIGATION

Construction stage

14.146. The likelihood of any residual impacts following the implementation of the mitigation measures outlined below is likely to result in negligible effects.

Flood risk

14.147. The DCO Site is predominantly at low to high risk of flooding from fluvial and pluvial sources. It is recommended that construction workers, site managers and site visitors monitor local weather warnings for heavy rainfall. Latest best practice guidance on working near watercourses should be followed by construction workers, such as the Health and Safety Executive's Personal buoyancy equipment on inland and inshore waters (1995).

14.148. In addition, site compound welfare facilities and materials will be stored outside of the floodplain.

Surface water quantity and quality

14.149. An outline Construction Environmental Management Plan (CEMP) will be prepared and submitted as part of the ES and DCO documentation to outline methods and monitoring requirements to prevent effects on Surface Water and Flood Risk, as a result of the construction phase.

14.150. Large areas of exposed topsoil or similar materials, including stockpiles, would be covered or contained where possible when not in use.

14.151. The diverted UOW will be constructed offline and will include measures to prevent erosion and the mobilisation of sediments. Appropriate monitoring will also be followed to identify and mitigate any pollution incident.

14.152. Wheel washing facilities and regular sweeping would be undertaken to prevent dust build-up and silt on roads. Wheel washing facilities should be in a designated bunded impermeable area and surplus water from washing would be disposed of via the foul water system or treated adequately prior to disposal.

14.153. Concrete would be mixed off-site where possible. Where this is not possible, waste water from concrete production and lorry washing would be limited to a designated bunded impermeable area to prevent contaminated water entering watercourses. Wastewater would be directed to the foul water network or adequately treated prior to disposal.

14.154. To avoid infiltration of polluted water from vehicles or accidental spillage, vehicles would be inspected regularly and maintained to reduce the risk of leakages. Vehicle wash-down areas would be at least 10m from any surface waters and located in a designated bunded impermeable area. Any runoff would be treated through oil interceptors prior to discharge.

14.155. On-site refuelling would be undertaken in a designated bunded impermeable area to prevent infiltration of contaminated waters.

14.156. As is the case for potential surface water pollution, a spillage or pollution incident could affect groundwater quality. Procedures to be set out in the CEMP would be specifically developed in order to reduce the likelihood of such uncontrolled discharge, spillage or pollution incident. If such an occurrence were to occur due to unforeseen circumstances, actions would be undertaken to limit the spread of any spillage and to clear the spillage prior to discharge to ground. Such actions would be detailed in an emergency response plan which would be prepared in accordance with the CEMP.

14.157. Storage facilities for oil and fuels would be in suitable above ground tanks. Any tanks storing more than 200 litres of oil will have secondary bunding. Any above ground storage tanks will be located on a designated area of hardstanding.

14.158. Where existing infrastructure is proposed to be used during the construction phase it would be fully assessed and where necessary serviced prior to use. It is assumed that the infrastructure is appropriate for the intended use.

14.159. Drip trays would be used under vehicles where appropriate to ensure that oil is collected and contained to prevent infiltration of contaminated waters.

14.160. Designated pathways would be provided for large vehicles to limit the areas impacted by soil compaction. This will reduce the effect of soil compaction on infiltration and subsequently increased pooling of surface water.

Foul water

14.161. STW would be consulted prior to the start of construction works to understand suitable connection points for foul water during the temporary construction phase.

Potable water supply

14.162. STW would be consulted prior to the commencement of construction works to understand the impacts of the increased demand for water supply as a result of the construction phase.

Operational stage

14.163. The likelihood or any residual impacts following the implementation of the mitigation measures outlined below is likely to be negligible or minor beneficial in significance.

Flood risk

14.164. Using the baseline model of the Thurlaston Brook Tributary, UOW and minor watercourses, appropriate mitigation will be provided to ensure that no land outside the Main HNRFI Site would be at an increased risk of fluvial and surface water flooding. Any residual impacts with the implementation of mitigation measures will be minor beneficial in significance due to the general decrease in flows in higher return period events improving the situation off-site.

14.165. An FRA and Drainage Strategy, including a technical note to describe the hydraulic modelling has been prepared and appended to the PEIR (see appendices 14.1 and 14.2).

Surface water quantity

14.166. An appropriate drainage strategy including SuDS will be identified to reduce surface water runoff rates and direct any pluvial flow paths towards a positive drainage system. Existing surface water runoff routes are likely to be altered once the Proposed Development is operational and, as such, to prevent an adverse impact on the wider catchment an appropriate drainage strategy is necessary. The detailed foul and surface water drainage strategy for the Main HNRFI Site is appended to the FRA and Drainage Strategy.

14.167. Overall, the Proposed Development will provide a betterment in regard to water quantity control, particularly for the higher return period events (e.g., storm events of heavy rainfall). By restricting the volume generated by the natural catchment of flows leading to the Thurlaston Brook Tributary, UOW and other minor watercourses, the Proposed Development will help to reduce the likelihood and severity of flooding downstream of the Main HNRFI Site and A47 Link Road.

14.168. The off-site works might necessitate a small increase in impermeable area and thus a theoretical impact on existing drainage infrastructure. Given the relatively small-scale of many of these, and their location within or adjacent to the existing highway, these works are not likely to have any major impacts on flood risk. Indeed, the new works could offer opportunities to improve or reinforce the existing highways drainage infrastructure.

14.169. A new surface water drainage network has been designed for the Proposed Development and will be further developed and submitted as part of the DCO application. It is acknowledged that a development should aim to achieve greenfield run-off rates wherever feasible and should ensure that surface water run-off is managed as close to

its source as possible in line with local policy to:

- store rainwater for later use;
- use infiltration techniques, such as porous surfaces in non-clay area;
- attenuate rainwater in ponds or open water features for gradual release;
- attenuate rainwater by storing in tanks or sealed water features for gradual release;
- discharge rainwater direct to a watercourse;
- discharge rainwater to a surface water sewer/drain; and then
- discharge rainwater to the combined sewer.

14.170. The proposed surface water drainage network seeks to discharge via outfalls to the Thurlaston Brook Tributary under appropriate consent from the EA. This discharge would be at an equivalent greenfield rate and the EA has advised that this is likely to be acceptable. The reduction in the rate of surface water discharge from the Main HNRFI Site as a result of the Proposed Development (from an unrestricted and unmanaged rate to an equivalent greenfield rate) would be achieved through use of a range of SuDS techniques. Therefore, the proposed drainage network would act to reduce downstream flood risk through on-site attenuation.

14.171. The impact of the Proposed Development upon surface water quantity following mitigation is considered to be minor beneficial.

Surface water quality

14.172. The Proposed Development's facilities management team would also be responsible for cleaning and maintenance of proposed oil interceptors which would mitigate against the potential impact of contaminated surface runoff entering the drainage system. A maintenance schedule for the proposed SuDS measures would also be prepared such that the effectiveness of the proposed stages of water quality treatment remains for the lifetime of the Proposed Development.

14.173. A WFD Compliance Assessment has been produced to support the ES, which assesses the impacts and water quality and quantity in relation to the designated waterbodies potentially affected by the Proposed Development. It identifies mitigation measures that will be incorporated to improve the wider water environment and prevent deterioration in water body status. Initial assessment of the scheme under the WFD concludes that, subject to implementation of mitigation and design principles, the Main HNRFI Site is unlikely to result in a deterioration in the current ecological status of the Thurlaston Brook and Soar Brook catchments or the Soar Secondary Combined ground water body, nor is it likely to compromise progress towards achieving good status.

14.174. The change of use of the Main HNRFI Site will be of benefit due to reduced farming

activities which are currently considered a key explanation for the Thurlaston Brook and Soar Brook catchments not reaching Good WFD status.

14.175. The impact of the Proposed Development upon potential contamination of water resources is deemed to be minor beneficial.

Foul water

14.176. Following network upgrades to the Elmesthorpe – Bostock Close SPS the impact of the Proposed Development upon the existing sewerage network is considered negligible.

Potable water

14.177. The increase in water demand as a result of the Proposed Development is unlikely to but could lead to an impact on the capacity of the local public water supply. It is anticipated that any increase in water demand will be reduced as far as possible by the incorporation of appropriate water-saving devices, wherever practicable. The buildings will be designed to maximise water efficiency through low water use sanitary appliances and optimising hot water use in appropriate locations.

RESIDUAL ENVIRONMENTAL EFFECTS

Construction

14.178. A CEMP will be prepared and submitted with the ES and DCO documentation which will set out detailed methodologies and monitoring requirements to prevent adverse effects on flood risk and drainage. As a result, there would be negligible residual impacts from the development during the construction phase, which are not considered to be significant.

14.179. Assuming welfare facilities are appropriately installed and managed at the DCO Site, there will be a negligible residual impact from the construction phase.

14.180. The surface water drainage strategy will also mitigate the impacts of the development on groundwater and local watercourses, by directing runoff to appropriately constructed drainage features.

14.181. Subject to appropriate network improvement works, the impact on the foul water network is considered negligible.

Operation

14.182. The profiling of ground levels will direct runoff away from the built development.

14.183. Appropriate management of surface water runoff from the Main HNRFI Site and A47 Link Road will ensure that flood risk is not increased elsewhere.

14.184. These measures will ensure that the Main HNRFI Site and A47 Link Road has a negligible

effect on flood risk, which is not considered to be significant.

14.185. Any potential impacts likely to arise as part of the operational phase would be negligible in nature once mitigation has been incorporated into the development. There are likely to be minor beneficial effects in the form of a reduced risk of flooding in more extreme events because of reduced rates of discharge from the Main HNRFI Site into local watercourses and as a result of the drainage strategy, as well as the change of use from agricultural which is currently a key issue preventing the Thurlaston and Soar Brook catchments reaching Good WFD status.

CUMULATIVE AND IN-COMBINATION EFFECTS

14.186. There are no current existing or permitted schemes that are relevant to, or would represent a cumulative impact with, the Proposed Development regarding surface water and flood risk. Additionally, any other committed developments nearby would be subject to similar requirements of national planning policy and best practice to limit surface water runoff, and to manage water efficiently and in a sustainable way, including with regards to climate change.

14.187. Therefore, no cumulative effects are predicted with the relevant committed developments identified for consideration by this PEIR Chapter.

14.188. Outside of the committed developments, any emerging proposals would adhere to the same principles with regards to reducing flood risk and limiting surface water runoff, therefore it can be considered likely that there would be no cumulative adverse impact the/these development/s being constructed.

14.189. Therefore, the cumulative impact should the existing, permitted or emerging schemes be approved and delivered would be negligible or minor beneficial.

CLIMATE CHANGE

14.190. The baseline environment is expected to be at risk of changing due to the impacts of climate change.

14.191. Climate change is likely to increase flood levels associated with the Thurlaston Brook, UOW, Soar Brook and other minor watercourses and subsequently, increase risk of flooding both within the DCO Site and downstream. The hydraulic modelling includes an assessment of climate change and mitigation measures proposed based upon the results. With the implementation of mitigation measures, the effect of climate change on the fluvial flood risk to the Proposed Development is considered negligible.

14.192. The Main HNRFI Site and A47 Link Road might be at an increased risk of surface water pooling because of increased rainfall. The increase in impermeable surfaces within the Main HNRFI Site will also increase runoff towards the local watercourses. However, the drainage strategy for the Main HNRFI Site will be designed to account for climate change.

Additionally, reduced rates of discharge because of the drainage strategy may provide downstream benefits in the form of reduced flood risk. As such, the effect of climate change on surface water flood risk is considered to be negligible or minor beneficial.

SUMMARY AND CONCLUSIONS

14.193. This PEIR chapter has provided an interim assessment of the effects of the construction and operation of the Proposed Development on surface water and flood risk.

14.194. An assessment of the significance of the effects was undertaken based on the DMRB, adapted for this assessment, and considering the sensitivity of each resource and the magnitude of the effect. Effects of moderate significance or above were considered to be significant.

14.195. There will inevitably be an increase in the volume of surface water runoff post-development prior to mitigation. The surface water drainage strategy will ensure surface water will be managed appropriately to ensure that the rate of surface water arising from the Main HNRFI Site and A47 Link Road is not increased and water quality is not compromised. The drainage strategy will take account of climate change. The minor nature of the off-site works mean they will have negligible impact on flood risk and water quality.

14.196. Pollution control methods will supplement the use of SuDS on-site to provide pre-treatment to surface water from higher risk pollution areas such as highways and car parking areas.

14.197. With appropriate mitigation in place, no significant adverse effects will remain as a result of the Proposed Development.

Tritax Symmetry (Hinckley) Limited

HINCKLEY NATIONAL RAIL FREIGHT INTERCHANGE

Preliminary Environmental Information Report

Chapter 15: Hydrogeology

January 2022

This document forms a part of a Preliminary Environmental Information Report (PEIR) for the Hinckley National Rail Freight Interchange project.

A PEIR presents environmental information to assist consultees to form an informed view of the likely significant environmental effects of a proposed development and provide feedback.

This PEIR has been prepared by the project promoter, Tritax Symmetry (Hinckley) Limited. The Proposed Development is described in Chapter 3 of the PEIR and is the subject of a public consultation running from 12 January to 9 March 2022.

Details of how to respond to the public consultation are provided at the end of Chapter 1 of the PEIR and on the project website:

http://www.hinckleynrfi.co.uk/

This feedback will be taken into account by Tritax Symmetry (Hinckley) Limited in the preparation of its application for a Development Consent Order for the project.

Chapter 15 ◆ Hydrogeology

INTRODUCTION

15.1. This PEIR Chapter considers the likely significance of the environmental impact of the Proposed Development on the hydrogeology beneath the Main Order Limits Site and the local area. The PEIR has been undertaken in accordance with the requirements as set out within the National Policy Statement for National Networks, and with reference to relevant local plans.

15.2. The Chapter is supported by the following appendices:

- Appendix 15.1 BWB Consulting Ltd for Tritax Symmetry (Hinckley) Ltd, Hinckley Rail Freight Interchange, Hinckley, Phase 1 Geo-Environmental Assessment Ref HNRFI-BWB-ZZ-XX-RP-YE-0001-Ph1-S1-P1.

- Appendix 15.2 Hydrock Consultants Limited. December 2018. 'Hinckley strategic Rail Freight Interchange – Ground Investigation Report', Ref 07700-HYD-XX-XX-RP-GE-1002-P1-S2.

METHODOLOGY AND DATA SOURCES

15.3. The PEIR assesses the likelihood of existing contamination being encountered during the construction process, such that it could cause significant effects on groundwater if not addressed adequately at the construction and/or operational stages, and physical effects on underlying aquifers from the Proposed Development. Construction will entail bringing materials onto site (such as fuel) which if spilt or leaked could result in groundwater contamination.

15.4. A risk-based approach in accordance with Defra[1] and the Environment Agency[2] guidance has been taken to assess contamination which may have a significant effect upon the construction and operation of the Proposed Development, or upon the wider environment as a consequence of the Proposed Development.

15.5. A desk study has been completed covering the Main Order Limits area with preliminary ground investigation undertaken at the Main HNRFI Site. Any required additional further ground investigation will be undertaken to support detailed earthworks and foundation design and to investigate areas that are currently inaccessible, for example operational areas

[1] Department for Environment, Farming and Rural Affairs; Environmental Protection Act 1990: Part 2A Contaminated Land Statutory Guidance; April 2012

[2] Land Contamination Risk Management (https://www.gov.uk/government/publications/land-contamination-risk-management-lcrm).

with farm yards and adjacent to the railway and M69. Based on the predominantly greenfield nature of the Main HNFRI Site there are unlikely to be significant pollutant linkages present at the Main HNFRI Site that would impact on the viability of the Proposed Development. Additional investigations will be completed following the making of any DCO and prior to construction works commencing on site in order to provide additional data to inform detailed design and associated mitigation. However, the preliminary GI undertaken is sufficient to allow adequate assessment for the purposes of the EIA Regulations.

General approach and data sources

15.6. The general methodology for assessing effects follows standard procedures and involved the following desk-based and intrusive processes:

- Review of national planning policy and local development plan policies (including, but not limited to, land contamination and Aquifer Protection).
- Review of published documents, current standards, and current best practice guidance.
- A reconnaissance of the Main HNRFI Site including the M69 junction area within the Main Order Limits, was completed in February 2018 and updated in August 2018, and the area of the A47 link corridor in May 2018 to confirm desk-based information and identify and confirm the current state and use of the site. No significant changes to the Main Order Limits are anticipated to have occurred since then.

15.7. Review of the following reports and information sources to provide site specific factual data upon geology, soils and groundwater and where available and relevant has also been used to support the development of the baseline ground model and assessment of baseline conditions:

- Groundsure reports, reference GSIP-2021-10711-3797 and HMD-214-7439283, included within the Phase 1 Report (Appendices 15.1);
- 1:2,500 and 1:10,000 scale Historical Ordnance Survey Mapping;
- Historical aerial photographs (Google Earth) and other imagery (Groundsure Report);
- British Geological Survey (BGS) 1:50 000 Scale, 'Coventry', Sheet 169, Solid and Drift, (1994);
- BGS online geological maps and exploratory hole records (www.bgs.ac.uk);
- MAGIC website (www.natureonthemap.naturalengland.org.uk/magicmap);
- 'Preliminary Desk Study – Hinckley Strategic Rail Freight Interchange'; by Hydrock for db Symmetry Ltd; ref. 07700-HYD-XX-XX-RP-GE-1001-S2-P1; dated 16th April 2019;
- Phase 1 Desk Study - Hinckley National Rail, Freight Interchange – A47 Link Road; by

Hydrock for db Symmetry Ltd; ref: 07700-HYD-XX-XX-RP-GE-1006; dated 12th June 2019; and

- 'Preliminary Ground Investigation Report – Hinckley Rail Freight Interchange'; by Hydrock for db Symmetry Ltd; ref. 07700-HYD-XX-XX-RP-GE-1002; dated 14th June 2019.

- Consultations with the Environment Agency ('EA') groundwater protection team and Blaby District Council, Leicestershire County Council, Hinckley and Bosworth Borough Council, contaminated land officers and other relevant stakeholders including National Highways, Forestry Commission, DEFRA and Historic England undertaken throughout the process.

15.8. The assessment of effects has been undertaken using Qualitative Risk Assessment Matrices set out in Table 15.2 to 15.4 developed from the baseline condition ground model and updated to reflect the effect during both construction and operational phases.

15.9. The construction phase of the Proposed Development to be assessed will comprise a phased enabling works package to prepare development platforms, comprising the demolition of existing buildings, stripping of topsoil and bulk earthworks using site won materials and provision of primary infrastructure. Construction of buildings will follow in a number of phases. It is likely that the earthworks would be completed in a single phase includingthe earthworks for the M69 J2 improvements and theA47 Link road, rail sidings and construction of development platforms.

15.10. The key activities of the operational phase will comprise road and rail logistics, maintenance of vehicles and rail stock, and storage and distribution of goods.

15.11. Where necessary suitable mitigation options are detailed and their residual effect measured in the same manner using updated and extended qualitative risk assessment matrices to demonstrate the residual effect after mitigation.

15.12. Cumulative effects have been considered in accordance with the principles set out in Chapter 20 where other committed or proposed developments are planned or being progressed that might affect the same receptors.

Consultation

15.13. A request for a scoping opinion was submitted to PINS in November 2020, with an opinion returned in December 2020. comments relating to Hydrogeology that were received are summarised in Table 15.1 below.

Table 15.1: 2020 Scoping Response

PINS ID Paragraph	Ref	Comments	Response
4.9.2 Table 14.1	Study area	The Inspectorate notes that a full description of the study area is not provided in the Scoping Report. The study area reflected in the ES should be clearly defined, with supporting figures where necessary, justified, and reflect the anticipated extent of potential impacts.	The Chapter provides a full description of the study area in Sections 15.15 and 15.16 and is shown on Figure 15.1.
4.9.3 14.7 14/18	Cross referencing	The Scoping Report states that this aspect chapter should be read in conjunction with Chapter 13 'Surface water and flood risk' and Chapter 15 'Geology, soils and contaminated land', both of which provide relevant additional guidance and potentially significant effects which would be taking account of. The ES should clearly set out the guidance and significant effects relevant to hydrogeology in these other chapters and within any other chapters providing clear cross references to these in the ES where necessary for the assessment.	This is noted The chapter has significant cross over with the Geology, soils and contaminated land chapter and shares a similar methodology. The baseline has been developed based on the Phase 1 and 2 Investigations for the site.
4.9.4 14.9	Policy	The Scoping Report notes the policies that will be considered. Hinckley and Bosworth Borough Council notes that 'Policy DM7: Preventing Pollution and Flooding' of the Site Allocations and	Hinckley and Bosworth Council were consulted as part of the Phase 1 assessment. The assessment looks at potential for pollution of controlled waters from the Proposed

		Development Management Policies is also relevant.	Development in sections 15.90 to 15.92 and 15.99 to 15.100.
4.9.5 14.11 14.12	Consultation	The Scoping Report states that the assessment will be supported and informed through consultations with various stakeholders, including the local authority and the EA. It should be clear in the ES how consultees' comments have informed the assessment. Note the request from Hinckley and Bosworth Borough Council to be consulted.	The list of consultees and their responses are listed in Table 15.2.
4.9.6 14.17 14.19	Baseline Conditions	The Scoping Report states that the baseline conditions will be developed further during the phase 1 preliminary risk assessment stage and the preliminary stages of the ground investigation. The results of the risk assessment and ground investigation should be included as part of the ES. The ES should describe how baseline conditions have been established and how future changes from the which might affect groundwater and surface water quality have been assessed from these baseline conditions using the proposed conceptual model. The Scoping Report states that existing groundwater resources are to be assessed during a desk study phase, including the potential significance of	The Phase 1 PRA and Ground investigation reports are appendices to the PEIR. The PEIR sets out the Conceptual Site Model and the significant effects from the Proposed Development. The PEIR sets out the aquifer classification of the underlying geology and identifies any sensitive abstractions that could be affected by the Proposed Development.

		any groundwater resource value. The groundwater resource value(s) should be explicitly explained in the ES and how this has informed the assessment.	
4.9.7 14.20 14.22	Potential effects	The Scoping Report states that the Proposed Development has the potential to affect the existing groundwater during the construction phase, leading to the mobilisation of existing contaminants or through spillages of construction materials or fuels. The Proposed Development could also lead to the sterilisation of land that may have been a significant future resource for groundwater abstraction. The ES should highlight any likely significant adverse effects and any mitigation as required including remedial measures.	The potential for contamination to affect groundwater resources during the construction and operational phases is assessed in Section 15.86 to 15.93.
4.9.8 n/a	Temporal scope	The aspect chapter makes no reference to potential hydrogeological impacts during the Proposed Development's operational phase. The ES should assess impacts to hydrogeology during all phases of the Proposed Development including during operation, if significant effects are likely.	The PEIR covers impacts from the Operational phase including pollution from fuel storage in Sections 15.90 to 15.92

15.14. The following regulatory bodies have been contacted to ascertain whether they hold any records which may be pertinent to the environmental risk assessment:

Table 15.2: Consultation responses

Stakeholder	Summary of Response	Action within PEIR
Environment Agency	No response received	
National Highways	Noted that the NH hold ground conditions information on the M69. HD622 geotechnical reporting will be required for geotechnical design of highway improvements	Noted for Future Geotechnical Design Work
Forestry Commission	No response received	N/A
DEFRA	No response received	N/A
Historic England	No specific information held	N/A
Leicestershire County Council	Searches confirmed no significant issues with respect to contaminated land associated with the Main HNRFI Site.	None
Hinckley and Bosworth Borough Council	Noted that Burbage Common is identified as an area of interest due to historical use a as a rifle range between 1885 and 1931. The northern tip of Burbage common falls within Area 2.	Noted as a potential source of contamination
Blaby District Council	Noted historic land uses and current land uses such as railway activities, fuel storage on existing farms and made ground which is associated with development of M69 and associated bridges.	Covered in Phase 1 Assessment.
Burbage Parish Council	No additional requirements above those set out in the scoping report	N/A
Elmesthorpe Parish Council	No response received	N/A

Study Area

15.15. The extent of the study area is the land within the proposed Main Order Limits plus a buffer, extending to 500m from the Main Order Limits Site boundary including land required for construction of compounds, construction/storage sites and other land required for the works. Ground and surface water abstractions have been assessed within a 2km buffer from the Main Order Limits. The extent of this zone has been developed using professional judgement on the basis that contamination migration beyond this distance is likely to be minimal or could be mitigated and off site sources beyond this zone are unlikely to affect the Main Order LimitsSite.

15.16. For the purposes of the assessment, the Main Order Limits have been split into three

sections; Area 1 comprising the Main HNRFI Site, Area 2 comprising the A47 Link Road, and Area 3 consisting of the improvements to the M69 Junction 2 road network. There are additional areas within the order limits that will be subject to offsite highway and rail crossing works, but will not require any significant physical works which are likely to affect hydrogeology. The Areas are set out on Figure 15.1.

Identifying risks

15.17. In line with the *Land Contamination Risk Management*[3], the Preliminary Risk Assessment includes a Hydrogeological Hazard Identification ('HAZID'), which seeks to list all the suspected contaminant sources, the controlled waters receptors that might be harmed by those sources and the pathways via which the sources might reach the receptors to cause the harm. The source-pathway-receptor concept is known as a contaminant linkage (formerly a pollutant linkage) and only when a linkage is complete is there any possibility of risk of harm arising. The source-pathway-receptor concept will be assessed through production of a Conceptual Site Model ('CSM').

15.18. In addition physical effects on the aquifers from the Proposed Development, for example from earthworks or reduced recharge through sealing of the site with low permeability surfacing or buildings are also considered.

15.19. Beneficial and adverse impacts have been identified, and options have been outlined for mitigating any potential adverse effects from the construction and operation. Cumulative effects of the Proposed Development in relation to other known committed or proposed schemes will also be addressed in accordance with the principles in Chapter 20 where necessary.

Determining the significance of effects

15.20. The approach described above forms the basis of the methodology used in the assessment. For contamination to present a significant potential effect a link must first be established within the CSM. The likelihood of a pollutant linkage must be demonstrated with an identifiable source (onsite or off site), a receptor and a viable pathway.

15.21. Potential sources have been identified from an assessment of current site uses and activities, review of historical mapping for former uses and a review of regulatory permits, consents and authorisations contained within the Groundsure report for the site for potentially contaminative sites such as landfills, environmental permits, pollution controls.

15.22. Pathways will be specific to the hydrogeology and groundwater type. For example, they could be:

- infiltration and contaminant migration through permeable strata such as the unsaturated zone for groundwater; or

[3] Land Contamination Risk Management (https://www.gov.uk/government/publications/land-contamination-risk-management-lcrm) is the governments primary guidance on the assessment and management of the risks from land contamination.

- a secondary pathway from groundwater contamination to surface water.

15.23. The sensitivity of potential receptors can be described qualitatively according to the categories shown in Table 15.3.

Table 15.3: Criteria for assessing receptor sensitivity

Receptor sensitivity/ Value of Resource	Explanation	Receptor/ Resource
High	The receptor has low ability to absorb change without fundamentally altering its present character, is of high environmental value, or is of national importance.	Surface water bodies of high quality e.g. main rivers and primary tributaries with good biological and/or chemical quality and/or Principal Aquifers
Moderate	The receptor has moderate capacity to absorb change without significantly altering its present character, has some environmental value, or is of regional importance.	Surface water bodies of moderate quality, and/or Secondary A Aquifers
Low	The receptor is tolerant of change without detriment to its character, is low environmental value, or local importance.	Secondary B and undifferentiated aquifers

15.24. The magnitude of land contamination effects are assessed by comparing all contaminant linkages at a baseline value (existing condition) to those during construction and operational circumstances. This provides a way of assessing adverse and beneficial effects through the project lifecycle. The magnitude will be assessed using a four-point scale as shown in Table 15.4.

Table 15.4: Effect magnitude criteria

Effect Magnitude	Criteria
High	Results in total loss of attribute and/or likely to cause exceedance of statutory objectives and/or breach of legislation.
Moderate	Results in effect on integrity of attribute/or loss of part of attribute, and/or possibly cause exceedance of statutory objectives and/or breach of legislation.

Low	Results in minor effects on attribute e.g. measurable effect but below a level that would breach legislative or statutory limits.
Negligible	Results in no change or effect on attribute

15.25. The assessment of significance is based on the magnitude of the effect and the importance or sensitivity of the receptors as set out below in Table 15.5. The significance of the potential effects is identified, as well as those of the residual effects for geological and mineral effects. Appropriate mitigation measures will be recommended in order to reduce/control any significant adverse effects on sensitive receptors. Once remediated, there should be no residual effects with respect to land contamination issues.

Table 15.5: Significance of effect matrix

Magnitude of Change	Sensitivity of Receptor				
		High	**Medium**	**Low**	**Negligible**
	High	Major	Major / Moderate	Moderate	Slight
	Medium	major / Moderate	Moderate	Moderate / Slight	Slight
	Low	Moderate	Moderate / Slight	Slight	Negligible
	Negligible	Slight	Slight	Negligible	Negligible

15.26. Effects have the potential to be adverse, beneficial or neutral and temporary or permanent. For example, in terms of beneficial effects, the Proposed Scheme may remove a source of contamination or it may break a pathway that currently links a source to a receptor. The Effects Criteria is presented in Table 15.6.

15.27. The Duration of the effect is also considered.

- Short-term. Temporary effects related to a specific construction event of no more than a year's duration – such as the construction of an individual building or a specific element of infrastructure such as a section of road..
- Medium-term: Temporary effects of longer duration, such as those arising over an extended period of construction ranging from one year to the full construction period, envisaged to be ten years.
- Long-term. Permanent effects arising from the operation of the HNRFI or from the permanent presence or removal of physical features.

15.28. Effects of Moderate Significance are considered significant in terms of the PEIR, where

effects are considered to be marginal moderate/slight a precautionary approach has been adopted depending on the severity or likelihood of the effect, and further consideration given as to whether mitigation is necessary.

Table 15.6: Significance effect criteria

Significance	Description
Major adverse	Short term risk of pollution of sensitive water resource.
Moderate adverse	Pollution of sensitive water resources.
Slight adverse	Pollution of non-sensitive water resources.
Neutral	Effects, although not necessarily significant harm, which may result in a financial loss, or expenditure to resolve.
Slight beneficial	Minor reduction in risk (slight, short or highly localised effect)
Moderate beneficial	Moderate reduction in risk, Improvement in water quality
Major beneficial	Major reduction in risk

Limitations and assumptions

15.29. At the time of writing, access to the Main Order Limits Site to undertake a detailed Site walkover had not been granted to the author, and therefore descriptions of all areas of the Main Order Limits Site are based on previous reports by others, for the previous application. It is anticipated that access to the site will granted prior to submission of the ES. However, it is not expected that significant changes to the Main Order Limits Site will have occurred since the previous investigations were completed.

15.30. Intrusive ground investigation has only been completed within Area 1, the Main HNFRI Site and was limited to shallow trial pits and boreholes. Investigation of deeper strata and areas 2 and 3 will be completed as part of detailed design following submission of the ES. Nevertheless, the investigations completed are sufficient in scope to inform the assessment for the purposes of the EIA Regulations.

RELEVANT LAW, POLICY AND GUIDANCE

15.31. The applicable legislative framework for Contaminated Land is set out in Part 2A of the Environmental Protection Act 1990 and associated statutory guidance. Non statutory Guidance on management of Contaminated Land (Land Contamination Risk Management) is issued by the Environment Agency.

Part IIA of the Environmental Protection Act, (1990)

15.32. Part IIA of the Environmental Protection Act, (1990) and the associated Statutory

Guidance [4]describes a regulatory role for Local Authorities in dealing with contaminated land;

15.33. Environment Act, (1995) creates a system whereby Local Authorities must identify and if necessary, arrange for the remediation of contaminated sites. The provisions are set out in Section 57, which inserts Part IIA into the Environmental Protection Act, 1990. In addition to these requirements, the operation of the regime is subject to regulation and statutory guidance;

15.34. The Act provides a definition of what constitutes 'contaminated land' and sets out the responsibilities of the Local Authority and the EA in the identification and management of contaminated land. Under the Regulations, contaminated land is defined as:

- 'land which is in the opinion of the Local Authority to be in such a condition by reason of substances in or under the land that:
- Significant harm is being caused or there is significant possibility of significant harm being caused; and
- Significant pollution of controlled waters is being caused or there is a significant possibility of significant pollution of controlled waters being caused'.

15.35. Harm is defined in relation to harm to the health of living organisms or other interference with the ecological systems of which they form a part, and in the case of man includes harm to property. The potential for harm to occur requires three conditions to be satisfied:

- presence of substances (potential contamination/pollutants) that may cause harm (source of pollution);

  the presence of a receptor which may be harmed e.g. the water environment or humans, buildings, fauna and flora (the receptor); and

- the existence of a linkage between the source and receptor (the pathway).

15.36. Therefore, the presence of measurable concentrations of contaminants within the ground and subsurface environment does not automatically imply that a contamination problem exists, since contamination must be defined in terms of pollutant linkages and unacceptable risk of harm.

15.37. The nature and importance of both pathways and receptors which are relevant to a particular site will vary according to the intended use of the site, its characteristics and surroundings.

[4] Department for Environment Farming and Rural Affairs; Environmental Protection Act 1990: Part 2A Contaminated Land Statutory Guidance; April 2012 https://www.gov.uk/government/publications/contaminated-land-statutory-guidance

National Policy Statement for National Networks (NPSNN) 2014[5]

'4.46 Issues relating to discharges or emissions from a proposed project which affect air quality, water quality, land quality and the marine environment, or which include noise and vibration, may be subject to separate regulation under the pollution control framework or other consenting and licensing regimes. Relevant permissions will need to be obtained for any activities within the Proposed Development that are regulated under those regimes before the activities can be operated.

4.50 In deciding an application, the Examining Authority and the Secretary of State should focus on whether the development itself is an acceptable use of the land, and on the impacts of that use, rather than the control of processes, emissions or discharges themselves. They should assess the potential impacts of processes, emissions or discharges to inform decision making, but should work on the assumption that in terms of the control and enforcement, the relevant pollution control regime will be properly applied and enforced. Decisions under the Planning Act should complement but not duplicate those taken under the relevant pollution control regime.

4.55 The Secretary of State should be satisfied that development consent can be granted taking full account of environmental impacts. This will require close cooperation with the Environment Agency and/or the pollution control authority, and other relevant bodies, such as the MMO, Natural England, Drainage Boards, and water and sewerage undertakers, to ensure that in the case of potentially polluting developments:

- *the relevant pollution control authority is satisfied that potential releases can be adequately regulated under the pollution control framework; and*
- *the effects of existing sources of pollution in and around the project are not such that the cumulative effects of pollution when the proposed development is added would make that development unacceptable, particularly in relation to statutory environmental quality limits.*

5.168 Applicants should take into account the economic and other benefits of the best and most versatile agricultural land (defined as land in grades 1, 2 and 3a of the Agricultural Land Classification). Where significant development of agricultural land is demonstrated to be necessary, applicants should seek to use areas of poorer quality land in preference to that of a higher quality. Applicants should also identify any effects, and seek to minimise impacts, on soil quality, taking into account any mitigation measures proposed. Where possible, developments should be on previously developed (brownfield) sites provided that it is not of high environmental value. For developments on previously developed land,

[5] National Policy Statement for National Networks (NPSNN) 2014, Presented to Parliament pursuant to Section 9(8) and Section 5(4) of the Planning Act 2008, December 2014
https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/387223/npsnn-web.pdf

applicants should ensure that they have considered the risk posed by land contamination and how it is proposed to address this.

National Planning Policy Framework (NPPF) (2021)[6]

15.38. The National Planning Policy Framework (NPPF) (2021) sets out the Government's planning policies for England. It makes the following reference to Contaminated Land and ground conditions in the section entitled Conserving and enhancing the natural environment:

'174. Planning policies and decisions should contribute to and enhance the natural and local environment by:

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

f) remediating and mitigating despoiled, degraded, derelict, contaminated and unstable land, where appropriate.'

15.39. It also makes the following references to ground conditions and pollution:

'Planning policies and decisions should ensure that:

183. a) a site is suitable for its proposed use taking account of ground conditions and any risks arising from land instability and contamination. This includes risks arising from natural hazards or former activities such as mining, and any proposals for mitigation including land remediation (as well as potential impacts on the natural environment arising from that remediation);

b) after remediation, as a minimum, land should not be capable of being determined as contaminated land under Part IIA of the Environmental Protection Act 1990; and

c) adequate site investigation information, prepared by a competent person, is available to inform these assessments.

184. Where a site is affected by contamination or land stability issues, responsibility for securing a safe development rests with the developer and/or landowner.'

15.40. Assessment of the impact of the Proposed Development will also be undertaken in accordance with, but not limited to, the below policies:

- Blaby District Local Plan (Core Strategy) Development Plan, February 2013 ;

[6] Department for Levelling Up, Housing and Communities, The National Planning Policy Framework (NPPF) was first published on 27 March 2012 and updated on 24 July 2018 and 19 February 2019. This sets out the government's planning policies for England and how these are expected to be applied. https://www.gov.uk/guidance/national-planning-policy-framework

- Blaby District Local Plan (Delivery) Development Plan Document (DPD) Adopted February 2019;
- Hinckley and Bosworth Site Allocations and Development Management Policies DPD,
- District of Harborough, Harborough Local Plan 2011 to 2031, Adopted 30 April 2019
- Rugby Borough Council Local Plan 2011-2031 June 2019

15.41. Assessment of the impact of the Proposed Development will also be undertaken in accordance with, national guidance published by the Environment Agency:

- EA Guidance on Land Contamination Risk Management (LCRM); and
- Environment Agency Groundwater Protection Guidance.

Blaby District Local Plan Core Strategy[7]

Policy CS19 - Bio-diversity and geo-diversity

Strategic objectives

vi) To protect the important areas of the District's natural environment (species and habitats), landscape and geology and to improve biodiversity, wildlife habitats and corridors through the design of new developments and the management of existing areas by working with partners.

Blaby District Local Plan Delivery DPD – Adopted February 2019[8]

Policy DM13 Land Contamination and Pollution

Land Contamination and Pollution

Development proposals will be required to clearly demonstrate that any unacceptable adverse impacts related to land contamination, landfill, land stability and pollution (water, air, noise, light and soils) can be satisfactorily mitigated.

For the following circumstances, development proposals will be supported where they are accompanied by a detailed investigation of the issues and appropriate mitigation measures are identified to avoid any adverse impact upon the site or adjacent areas:

a) Land that is (or has the potential to be) subject to land contamination or land stability

[7] Blaby District Council Local Plan (Core Strategy) Development Plan Document - Adopted February 2013, Blaby District Local Plan, Local Plan (Delivery) Development Plan Document Adopted February 2019
Https://Www.Blaby.Gov.Uk/Planning-And-Building/Local-Plan/Local-Plan-Delivery-Dpd/
Local Plan (Core Strategy) Development Plan Document Adopted February 2013
Https://Www.Blaby.Gov.Uk/Media/4107/Adopted-Core-Strategy.Pdf
[8] Blaby District Local Plan Delivery DPD – Adopted February 2019

issues;

b) Close to an aquifer or surface water feature that may result in groundwater or surface water pollution;

c) Close to or within an air quality management area or key transport corridors that may be affected by air quality;

d) Close to a source of noise or light pollution and/or the proposal may be a source of noise or light pollution;

e) Soils of high environmental value, including best and most versatile agricultural land.

This policy seeks to ensure that development proposals are not affected by or cause land contamination or pollution.

Land contamination, landfill and land stability

4.62 The NPPF encourages the effective use of land by re-using land that has previously been developed. However, to prevent unacceptable risks from pollution and land

4.63 The NPPF makes it clear that where a site is affected by contamination or land stability issues, responsibility for securing a safe development rests with the developer and/or landowner.

4.64 It is important that such sites are reclaimed to a level that is suitable for the future intended use and also that there is no contamination of water resources during the reclamation and redevelopment.

4.65 Other sources of potential pollution or land contamination include historical industrial sites, current industrial sites and other previously developed contaminated sites. As a general rule, development proposals within 250m of a landfill or contaminated site will require investigation.

Water Quality

4.66 The Water Framework Directive requires member states, among other things, to prevent deterioration of aquatic ecosystems and protect, enhance and restore water bodies to 'good' status. It applies to all surface waters and underground water storage.

The Humber River Basin Management Plan provides a holistic framework to protect and enhance the benefits of the water environment to people, the economy and wildlife. It sets out the actions needed to tackle problems that are affecting water quality.

Hinckley and Bosworth Site Allocations and Development Management Policies DPD adopted July 2016[9]

Policy DM7

Preventing Pollution and Flooding

Adverse impacts from pollution and flooding will be prevented by ensuring that development proposals demonstrate that:

a) It will not adversely impact the water quality, ecological value or drainage function of water bodies in the borough;

b) Appropriate containment solutions for oils, fuels and chemicals are provided;

c) All reasonable steps are taken through design, siting and technological solutions to ensure the abatement of obtrusive light to avoid sky glow, glare and light intrusion;

d) It would not cause noise or vibrations of a level which would disturb areas that are valued for their tranquillity in terms of recreation or amenity;

e) Appropriate remediation of contaminated land in line with minimum national standards is undertaken;

f) It will not contribute to poor air quality;

g) It will not result in land instability or further intensify existing unstable land; and

h) The development doesn't create or exacerbate flooding by being located away from areas of flood risk unless adequately mitigated against in line with National Policy.

District of Harborough, Harborough Local Plan 2011 to 2031, Adopted 30 April 2019[10]

GD8 Good design in development

1. Development will be permitted where it achieves a high standard of design, including meeting the following criteria:

n. where the site has previously been developed:

i. identifying the need for any decontamination and implementing this to an agreed programme; and

ii. ensuring that any contamination is not relocated elsewhere to a location where it could adversely affect the water environment or other wildlife habitats.

[9] Hinckley and Bosworth Site Allocations and Development Management Policies DPD adopted July 2016
[10] District of Harborough, Harborough Local Plan 2011 to 2031, Adopted 30 April 2019

GI5 Biodiversity and geodiversity

1. Nationally and locally designated biodiversity and geodiversity sites, as shown on the Policies Map, will be safeguarded.

2. Development will be permitted where:

a. there is no adverse impact on:

iii nationally designated sites;

iv. locally designated sites;

unless, in all cases, the need for, and benefits of, the development in that location clearly outweigh the impact.

b. there is no loss of any 'best and most versatile agricultural land' unless this is demonstrably necessary to facilitate the delivery of sustainable development;

c. there is no net loss or sterilisation of natural resources;

IN4 Water resources and services

Water resources will be protected and water services provided. Development will be permitted where it would: b. not adversely affect ground water quality by preventing potential sources of water pollution within Source Protection Zones (as identified on the Policies Map);

e. ensure the removal of any contamination from the site and that the development would not result in the migration of any contamination to a location where it could have an adverse affect upon the water environment;

Rugby Borough Council Local Plan 2011-2031 June 2019[11]

Policy SDC7: Protection of the Water Environment and Water Supply

Development will not be permitted where proposals have a negative impact on water quality, either directly through pollution of surface or ground water.

Development will not be permitted where the sensitivity of the groundwater environment, or the risk posed by the type of development is deemed to pose an unacceptable risk of pollution of the underlying aquifer.

[11] Rugby Borough Council Local Plan 2011-2032 June 2019

BASELINE CONDITIONS

Site description

15.42. The Main Order Limits site comprises an irregular shaped plot of land which is currently utilised for agricultural purposes, comprising fields and farm buildings, and includes sections of the local road and rail network.

15.43. The topography is variable with elevation ranging between c. 83m above ordnance datum (AOD) in the north beside the railway to c. 110m AOD at the M69 J2 motorway roundabout in the south, with levels of c. 93m AOD to 99mAOD in the A47 Link Road Corridor west of the Main Order Limits Site, c. 91m AOD in the east and c. 100m AOD in the centre of the Main HNRFI Site. The topography generally increases in elevation from north east to south west, with a slight ridge feature through the centre of the Main HNRFI Site orientated broadly in a south west to north east direction.

15.44. For the purposes of this section, the Main Order Limits ite has been split into three sections; Area 1 comprising the Main HNFRI Site, Area 2 comprising the arm to the north west containing the A47 Link Road Corridor, and Area 3 consisting of the M69 Junction 2 arm. The Areas are set out on Figure 15.1. Detailed walkovers were completed in 2018 and it is not anticipated that any significant changes to the Main Order Limits Site will have occurred since then. At the time of writing, access for further site walkover and investigation has not been arranged but access for further investigations will be granted before submission of the ES.

15.45. The negligible impact of the off-site Highway works outside of the main Order Limits means much of the PEIR Chapter relates to the Main Order Limits Site.

Area 1 – Main HNRFI Site Area

15.46. Area 1 comprises a large area of agricultural land, with Woodhouse Farm at the centre. The farm complex comprises several residential premises, agricultural outbuildings and barns, and small commercial premises including a farm shop and vehicle repair shop. Three oil tanks, a diesel tank and a propane tank were noted on site during the 2018 site walkover, with several corrugated roofs indicated to have been constructed from potentially asbestos containing materials (ACMs).

15.47. A small property utilised for kennelling services is located to the north west of Woodhouse Farm. Hobbs Hayes Farm was located to the south of Woodhouse Farm, with additional farm buildings, labelled Freeholt Lodge, located towards the southern extent of Area 1. Two tanks were identified at Hobbs Hayes Farm during the 2018 walkover utilised for diesel and heating oil storage. ACMs were tentatively identified in four barn rooves. Freeholt Lodge appeared to be disused with static caravans, tanks, and abandoned vehicles noted. A propane tank was noted, and ACMs also identified.

15.48. Burbage Common Road runs through Area 1 from the west, past Woodhouse Farm, before joining Stanton Road at the north east boundary. At the north western boundary Burbage Common Road crosses a bridge over the railway line. Smaller tracks also crossed Area 1 to the south west of Woodhouse Farm and to the south away from Hobbs Hayes Farm.

15.49. Drainage ditches ran along most field boundaries, with several small ponds located at various points around the field boundaries. A small stream flowed across the south of Area 1.

15.50. Area 1 is bound to the south east by the M69 and to the north west by a railway line. To the south west of site are three wooded areas known as Burbage Wood, Aston Firs and Freeholt Wood, with mobile home sites and agricultural land beyond. Burbage Common and Woods are located to the west. Sporadic farm buildings and residential premises are located to the north of Area 1, mainly along Station and Stanton Road.

Area 2 – A47 Link Road Corridor

15.51. Area 2 comprised a strip of land to the north west of Area 1, extending from the railway line to the B4668 (Leicester Road), with Burbage Common Road also crossing this location. The rest of Area 2 is occupied by fields, with a small densely vegetated stream crossing the north of Area 2 and a drain crossing the central area. Small farm outbuildings were present in some of the north western fields.

15.52. Area 2 was bound by the railway line to the south east and Leicester Road to the north west. Immediately west of Area 2 are agricultural fields and Burbage Common, whilst fields and Bridge Farm are located to the east. A sports club are located to the north west of Leicester Road.

Area 3 – M69 Junction 2 Improvements

15.53. Area 3 largely covers the road network around Junction 2 of the M69. Junction 2 provides access to the northbound M69, and egress from the southbound carriageway. The entry/exit ramps lead up to a raised roundabout over the M69 which involved two bridge crossings. Hinckley Road (B4669) joins the roundabout orientated in a west to east direction.

15.54. The boundary of Area 3 covers the roundabout, the northern slip roads, the access points to Hinckley Road, and extends to the south west beyond the point where Aston Lane crosses over the M69. The north eastern extent to Area 3 incorporates a small bridge which provides access for pedestrians and farm vehicles to cross the M69.

15.55. The M69 was predominantly raised above site levels and increases in topography from north east to south west from c. 96m AOD to c. 100m AOD. outh-west of M69 Junction 2 the M69 motorway falls gently to a height of c. 96m AOD at the southern extremity of the DCO Site.

15.56. A small stream was culverted under the M69 towards the south of the Area 3. Also, a pond is located immediately west of the M69 which appears to have been constructed at the same time as the motorway and is likely to be an attenuation basin as part of the drainage network.

15.57. The surrounding land use is predominantly agricultural, with two mobile home sites located to the north west of Junction 2 and Averley House Farm to the north east.

Site history

15.58. Historical Ordnance Survey (OS) mapping for the Main Order Limits Site area has been

reviewed. These maps and plans date from 1886 to 2014. The key points of the historical development of the Main Order Limits Site and surrounding area are summarised in Table 15.7. All distances quoted are approximate.

Table 15.7: Key points of development history

Dates	On Site (Main Order Limits including HNRFI Site and A47, M69 sliproads)	Off-Site (outside Main Order limits)
Potential **SOURCES** in bold and caps. Potential ***Receptors*** in bold and italics.		
1886 – 1938	The earliest site plans show the site as largely undeveloped, agricultural land, relatively similar to present day. **WOODHOUSE FARM** is present in the centre of the site with **HOBBS HAYES FARM** to the south. The **RAILWAY LINE** is mapped in the north west of the site. Numerous small ***ponds*** are mapped across the site with small ***streams*** mapped in the north, central and south of site along the same course as present day.	**ELMESTHORPE RAILWAY STATION** is mapped immediately north east of Area 1, with several **SIDINGS**. ***Old fish ponds*** are mapped c. 100m north of site and indicated to be excavations. A **BRICK WORKS** with associated **KILNS** are mapped adjacent to Hinckley Road immediately south east of Area 3, and also approximately 500m west of Area 1. Small scale associated clay pits are also indicated at the brick works. A rifle range is present immediately west of Area 2. ***Burbage Common***, ***Sheepy Wood***, ***Burbage Wood***, ***Aston Firs***, and ***Freeholt Wood*** are all located immediately west of Area 1 and 2. Both brick yards appear to be disused from 1901 plans, with the south eastern clay pit indicated to have been reduced to a small pond by 1963.
1950 - 1968	1963 plans show the B4669 (labelled as A5070) Hinckley Road as realigned. 1962 plans label the track to Woodhouse Farm as Burbage Common Road for the first time.	Residential development is mapped along Station Road 200-600m north east of Area 1. A **TANK** is indicated at the railway station from 1962 plans with a **FACTORY** mapped 200m north east of site. A **GARAGE** is mapped 400m south west of Area 3 on 1963 plans.
1977 - 1994	No significant changes noted.	The **M69** and associated access bridges have been constructed. Hinckley Road in the south of Area 3 is realigned as part of the M69 works, and the attenuation pond is constructed. Elmesthorpe Railway Station and sidings are no longer mapped from 1983 plans. The buildings remain, but the tank is no longer labelled. 1984 plans show an **ELECTRICITY SUBSTATION** mapped 200m north of site. 1994 plans indicate the former railway sidings site is occupied by a **SCRAP YARD**.
2002 – Present day	No significant changes noted.	The sports ground to the north west of Area 2 has been developed by 2002 plans.

Dates	On Site (Main Order Limits including HNRFI Site and A47, M69 sliproads)	Off-Site (outside Main Order limits)
		The eastern traveller site appears on mapping from 2002 with the western site mapped from 2010.

Ground conditions

Superficial deposits

15.59. Information published by the BGS has mapped localised Made Ground within the Main Order Limits Site. Made Ground is mapped along the M69 corridor and partially along the railway line, indicating areas which have been artificially raised. The lighter pink areas indicated areas of cut where the M69 passes under the roundabout, and the attenuation basin located to the west of Area 3.

15.60. The BGS data has recorded several superficial deposit units across the Main Order Limits Site, and also some areas where superficial deposits are absent.

15.61. The Bosworth Clay Member, also known as Wolston Clay, and Thrussington Member are mapped underlying most of the Main order limits Site, with the latter present towards to the south and south east of Area 1. The Bosworth Clay Member is typically encountered as variable grey and red-brown clays and silt, often without gravels, whilst the Thrussington Member is encountered as brown to reddish brown usually sandy silty clay with gravels present.

15.62. Deposits of the Wolston Sand & Gravel Member, also referenced as Glaciofluvial Deposits, are mapped in two locations in the centre of Area 1. These are younger deposits commonly encountered as yellow or red sand and gravel.

15.63. Localised Alluvium is mapped in the north and north east of Area 1 along the line of the stream and also along the watercourses in Area 2.

15.64. Superficial deposits are locally absent in the south east and east of Area 1, and across much of Area 2.

15.65. Small pockets of the Oadby Member are mapped in the central area. The Oadby member comprises Diamicton encountered as grey/ brown gravelly clay with subordinate lenses of sand and gravel, clay and silt.

Bedrock deposits

15.66. The bedrock underlying both the main site is indicated to comprise the Edwalton Member Mercia Mudstone. Mercia Mudstone is commonly encountered as red, or occasionally green-grey, mudstones and subordinate siltstones. The bedrock contains thick halite-bearing units in some basinal areas and thin beds of gypsum/anhydrite are widespread.

Third party investigation logs

15.67. The preliminary ground investigation conducted in 2018 (Appendix 15.3) generally confirmed the published geological sequences, with Bosworth Clay was found across much of Area 1 (excluding the central areas) and across the south of Area 3, and the Thrussington Member was recorded predominantly in the centre of Area 1 and across the northern parts of Area 3.

15.68. Limited Made Ground was encountered, predominantly around the farm complexes.

15.69. Localised Alluvium was recorded near to the watercourse flowing through Area 1. The Wolston Sand & Gravel Member was not recorded. Mercia Mudstone was recorded under the Glacial Deposits in the eastern areas, but not to the west of Area 1 of in Area 3.

Aquifer designation

15.70. The Environment Agency (EA) classifies the Alluvium and the Wolston Sand and Gravel as Secondary A Aquifers. Secondary A Aquifers are permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers.

15.71. The Bosworth Clay Member is an unproductive stratum, defined as rock layers or drift deposits with low permeability that have negligible significance for water supply or river base flow.

15.72. The Thrussington Member is an undifferentiated Secondary Aquifer which has been assigned in cases where it has not been possible to attribute either a Secondary A or B category to a rock type.

15.73. The Mercia Mudstone is categorised as a Secondary B Aquifer which are defined as predominantly lower permeability layers which may store and yield limited amounts of groundwater due to localised features such as fissures, thin permeable horizons, and weathering.

15.74. The Main Order Limits Site is not located within an EA designated Source Protection Zone. The Main Order Limits Site lies within the Soar Secondary Combined Water Framework Directive Groundwater Body which recorded a good chemical and overall rating in 2015.

15.75. Significant groundwater ingress was not recorded during the ground investigation. Groundwater was not recorded in any trial pit and in only 4 of the window sampler boreholes during the investigation at depths of between 3.1m and 3.9m bgl within the Thrussington Member and Mercia Mudstone.

15.76. Post investigation monitoring of boreholes recorded sporadic groundwater across the Main HNRFI site within the Thrussington Member, Boswoth Clay Member and Mercia Mudstone at depths of 0.83m to 4.5m bgl.

Surface water features

15.77. Within Area 1, drainage ditches run along most field boundaries, with several small ponds located at various points around the field boundaries. A small stream flows across the south of Area 1, and two small streams are present in the north of Area 1, flowing off site to the north.

15.78. Within Area 2, three small watercourses cross the site, with the southernmost appearing to have been channelised.

15.79. Within Area 3, a small drain is culverted under the M69.

15.80. The River Soar is mapped 175m south east of site.

Soil and groundwater contamination

15.81. The Phase 1 Assessment (Appendix 15.1) and preliminary GI (Appendix 15.2) concluded that limited potential contamination sources had been identified at the Main Order Limits Site. The contamination source within each area are described below. Potential sources located outside the Main Order limits area also considered where they could present a risk to water resources beneath the Main Order Limits Site.

Area 1 Main HNRFI Site

15.82. The following potential sources of contamination have been identified at the Main HNRFI site:

- Made Ground at the site but predominantly located around farm complexes could contain heavy metals, hydrocarbons, asbestos and a potential source of hazardous ground gasses.
- Asbestos within shallow soils around farm buildings.
- Hydrocarbons, lubricants and solvents located around tanks.
- Pesticides and herbicides within fields and along railway lines and in storage areas within farm complex.
- Organic rich Alluvium could represent a potential source of hazardous ground gasses.
- Biological contamination associated with cess pit (e.g. E-coli).

Area 2 A47 Link Road Corridor

- Made Ground at the site but predominantly located around farm buildings could contain heavy metals, hydrocarbons, asbestos and a potential source of hazardous ground gasses.
- Asbestos within shallow soils around farm buildings.

- Pesticides and herbicides within fields and along railway lines and in storage areas within farm complex.

- Organic rich Alluvium could represent a potential source of hazardous ground gasses.

Area 3 M69 Junction 2

- Made Ground at the site related to the construction of the road network. could contain heavy metals, hydrocarbons, and a potential source of hazardous ground gasses.

- Organic rich Alluvium could represent a potential source of hazardous ground gasses.

Off Site Outside Main Order Limits Boundary

- Railway station and subsequently scrap yard - potential source of heavy metals, hydrocarbons, volatile compounds, and hazardous ground gasses.

- Landfill – potential for leachate migration towards site.

- Organic rich Alluvium could represent a potential source of hazardous ground gasses.

- Electricity substation located 200m north represents potential source of oils and PCBs, not a potential source If it dates from 1980s onwards.

15.83. The following potential sources are not included within the conceptual site model:

- Infilled brick pits - potential source of hazardous ground gasses, however, they are located near to the proposed road structures rather than buildings. They are located too far from proposed buildings to represent a risk.

- Landfill – Potential ground gas risk associated with landfills is discounted as they are located too far from proposed buildings to represent a risk.

Receptors

15.84. The following Groundwater receptors are considered in the Hydrogeology Chapter:

Within Main Order Limits Boundary

15.85. The majority of the Main HRFI Site is underlain by the Bosworth Clay which is an unproductive strata. Within the Main Order Limits site the following aquifers are present.

- Underlying Secondary A Aquifer – Wolston Sand and Gravel.

- Underlying Secondary A Aquifer – Alluvium.

- Underlying undifferentiated Secondary Aquifer – Thrussington and Oadby Members.

- Underlying Secondary B Aquifer – Mercia Mudstone.

Outside Main Order Limits boundary

- Wider Secondary A Aquifer – Alluvium and Wolston Sand and Gravel.
- Wider undifferentiated Secondary Aquifer – Thrussington Member.
- Wider Secondary B Aquifer – Mercia Mudstone.

15.86. The risk to controlled waters was considered to be low based on the potential for contaminants associated with the Made Ground at the Main Order Limits Site to impact upon the underlying aquifer or on-site surface water receptors.

Limitations to assessment

15.87. The assessment is based on a Phase 1 Assessment comprising desk-based investigation, preliminary intrusive investigation and a 2018 site reconnaissance only. Further detailed intrusive investigation will be completed to support detailed design which may reveal previously unforeseen ground conditions or contamination. However, based on the desk study and site history it is unlikely that significant contamination would be identified at the Main Order Limits Site.

POTENTIAL SIGNIFICANT ENVIRONMENTAL EFFECTS OF THE PROPOSALS

Construction phase

15.88. The significant effects have been assessed assuming that the earthworks exercise will be completed at the Main Order Limits Site comprising a site strip to remove topsoil and a bulk earthworks cut and fill exercise to prepare development platform(s). A general cut and fill balance is assumed, whereby no material is required to be removed or imported from/to the site.

15.89. Shallow groundwater (below surface but within excavation depth of normal plant) has been recorded beneath the Main HNRFI Site which could be encountered within excavations. Perched groundwater will be encountered within the more granular layers within the Superficial Deposits and also at the interface between the Superficial Deposits and the underlying bedrock. Localised dewatering may be required for deeper excavations such as for below ground attenuation tanks, or fuel storage tanks. Based on the soil descriptions significant water ingress into excavations is not anticipated.

Risks to controlled waters

15.90. Localised contamination may be mobilised during construction, where soils are excavated, and incident rainfall leaches soluble contaminants. In addition, earthworks in general have the potential to increase erosion and migration of particulate matter and suspended solids into water courses, running across the Main HNRFI Site. Based on the expected development timescales, development plots may be prepared but will remain undeveloped for a considerable period before development, therefore careful management of runoff and

stockpiles will be required to prevent excessive suspended solids entering water courses. The effect on controlled waters during construction are considered to be of minor adverse significance, confined to a localised area and of short / medium duration.

15.91. Piled foundations may be required for the proposed buildings particularly where high loadings are required. This will be assessed on a building by building basis and will depend on tenant requirements and final detailed design. Piled foundations have the potential to create pathways between surface contamination and underlying aquifers. Any effect is likely to be minor based on the anticipated low levels of contamination and low sensitivity of the underlying aquifers.

Operational phase

Risks to controlled waters

15.92. The presence of significant hardstanding will reduce the infiltration of rainfall and subsequent leaching of any soluble contamination in shallow soils into underlying groundwater and surface waters.

15.93. Storage of fuels in the on site service station Runoff from goods vehicles using the site has the potential to be impacted by heavy metals and petroleum hydrocarbons.

15.94. Railway maintenance areas may involve storage of chemicals including fuels, lubricants and cleaning products. Temporary waste storage areas may be required. The effect on controlled waters during operation are considered to be of minor adverse significance, confined to a localised area and of short / medium duration.

Risks to groundwater abstractions and baseflow

15.95. Sealing of the site will reduce infiltration and recharge of shallow aquifers, which could lead to reduced groundwater levels. However significant volumes of groundwater are not expected beneath the site and there are no recorded abstractions that could be affected This effect on controlled waters during operation are considered to be of minor adverse significance, but would affect the whole site area.

PROPOSED MITIGATION

Construction phase

15.96. The design will incorporate significant earthworks to prepare platforms for development. Detailed investigation of the site will be completed to ensure that excavated materials are suitable for use and any areas of potential contamination fully characterized and remediation strategies prepared. The scale of the Proposed Development will allow any required soil treatment such as bioremediation to be completed and soils retained for re-use. Any remediation would be completed under an Environmental Permit.

15.97. A Construction Environmental Management Plan (CEMP) will be prepared and submitted as part of the ES and DCO documentation setting out the requirements for management of

dust, odours and other sources of nuisance and pollution control measures to be implemented during the construction phase. There will be a particular focus on management of run off and protection of water courses from suspended solids in runoff. This may include construction of temporary settlement ponds, silt fences and seeding of temporary stockpiles.

15.98. On-site refuelling should be undertaken in designated areas to prevent infiltration of contaminated waters. The revoked EA Pollution Prevention Guidance provides useful recommendations of best practice for refuelling, including regular testing and maintenance of storage tanks. All fuel tanks will be bunded with a capacity of 110% of the tank volume. Spill kits should be available at all fuelling locations and regular training provided on dealing with spillages. Drip trays should be used under vehicles where appropriate to ensure that oil is collected and contained to prevent infiltration of contaminated waters.

15.99. To avoid infiltration of polluted water from vehicles or accidental spillage, vehicles should be inspected regularly and maintained to reduce the risk of leakages. Vehicle wash-down areas should be at least 10m from any surface waters and located in a designated bunded impermeable area. Any runoff should be treated through oil interceptors prior to discharge.

15.100. Procedures to be set out in the CEMP would be specifically developed in order to reduce the likelihood of such uncontrolled discharge, pillage or pollution incident. If such an occurrence were to occur due to unforeseen incident, actions would be undertaken to limit the spread of any spillage and to clear the spillage prior to discharge to ground. Such actions would be detailed an emergency response plan which would be prepared in accordance with the CEMP.

Operational phase

15.101. Maintenance facilities and fuelling areas will be located on hardstanding with all tanks contained within appropriate bunding to accommodate 110% of the tank volume in accordance with best practice. Drainage will pass through three stage interceptors to capture any spillages and prevent contamination entering the drainage system and underlying groundwater.

15.102. The Operation and Maintenance plan will set out required intervals for inspection of pollution control equipment, including checking of bunding, cleaning of interceptors, wet stock checking and maintenance of spill kits.

RESIDUAL ENVIRONMENTAL EFFECTS

Construction phase

Soil and groundwater quality

15.103. The CEMP will set out the various measures to manage the impacts from earthworks, which may include seeding of stockpiles, silt traps and temporary drainage grips. The residual effect will be slight due to negligible magnitude of impact of a medium to high sensitivity of

controlled water receptors.

15.104. Detailed piling design, if required, and the associated methodology remains subject to intrusive ground investigations, to be undertaken at the appropriate time. If required, piling should be undertaken in accordance with best practice, as agreed with the relevant parties ahead of commencement of the works. The residual effect will be negligible due to negligible magnitude of impact of a low sensitivity resource.

Operational phase

Soil and groundwater quality

15.105. The Main HNRFI site has remained largely undeveloped and there is a low risk of soil or groundwater contamination being present. Completion of ground investigation, and implementation of any required remediation strategy will remove any unacceptable risk to groundwater. The residual effect will be negligible due to negligible magnitude of impact of a medium sensitivity resource.

15.106. There is a low risk of soil or groundwater contamination being present at the site and the Proposed Development will incorporate a predominantly hardstanding covering. This will minimise the infiltration of rainfall and recharge through the unsaturated zone thereby minimising potential contaminant mobility and reducing the risk to the underlying aquifer. The residual effect will be slight due to negligible magnitude of impact of a medium sensitivity resource.

15.107. Lubricants and refuelling facilities will be positioned away from the most sensitive receptors at the application site and incorporate suitable bunding and interceptors to capture any spillages and prevent pollution of underlying groundwater. The residual effect will be slight due to negligible magnitude of impact of a medium sensitivity resource.

CUMULATIVE AND IN-COMBINATION EFFECTS

15.108. The proposed and committed schemes listed within Appendix 20.1 have been reviewed and there are no current existing or permitted schemes that are relevant to, or would represent a cumulative impact with, the Proposed Development regarding Hydrogeology. Land contamination is subject to the same national guidance and all developments must meet a common standard for safe development with a requirement to undertake a phased investigation of the site including Phase 1 preliminary risk assessment, Phase 2 intrusive investigation remediation strategy, remediation implementation and verification. It is considered that there will be no significant cumulative effects on hydrogeology and contamination resulting from the Proposed Development and the cumulative schemes considered as part of the assessment, as each development will incorporate appropriate mitigation measures to have overall negligible, or slight positive effects, through for example, remediation of soil contamination associated with farm operations.

15.109. Consequently, it is considered that there are unlikely to be any cumulative effects on

hydrogeology. It is assumed that mitigation implemented for nearby schemes will be undertaken to this standard, hence there should be no need for cumulative mitigation measures. Therefore, no cumulative effects are predicted with the relevant committed developments identified for consideration by this PEIR Chapter.

CLIMATE CHANGE

Consideration of the potential implications of future climate change has been incorporated into this assessment. Specifically, the mitigation measures have been designed to ensure the Proposed Development will remain safe for its lifetime. Careful control and monitoring of earthworks will ensure that the engineered soils are placed in accordance with the earthworks specification.

SUMMARY AND CONCLUSIONS

15.110. This Chapter assesses the potential effects of the Proposed Development on Hydrogeology. It describes the methods used to assess the effects, the baseline conditions currently existing at the application site and surroundings, the potential direct and indirect effects of the Proposed Development and the mitigation measures required to prevent, reduce or offset the potential effects and the residual effects.

15.111. The Chapter is supported by a Phase 1 Preliminary Risk Assessment (Appendix 15.1) and a Preliminary Ground Investigation for the Main HNRFI site. The Main HNRFI site has predominantly remained undeveloped agricultural land with a number of farm buildings located on the Main HNRFI Site.

15.112. The Main Order Limits Site is indicated to be directly underlain by topsoil over drift deposits comprising glacial deposits of the Thrussington Member and Bosworth Clay Member. Localised deposits of Alluvium and the Wolston Sand & Gravel are mapped at the site. Bedrock is indicated to comprise the Mercia Mudstone. The majority of the site is underlain by unproductive strata, with small parts of the site designated as Secondary A or B or undifferentiated aquifers of low to moderate sensitivity. The site is not in a Source Protection Zone.

15.113. Potential impacts have been identified during construction associated with mobilisation of dusts and particulates entering water courses, and from piling works creating pathways, hover the effect of these impacts is negligible based on the low sensitivity of the underlying aquifers and absence of significant contamination.

15.114. The CEMP to be submitted with the ES will ensure that mobilisation of contamination and impact to controlled waters during the construction phase is minimised. The plan will outline detailed methodologies and monitoring requirements to prevent adverse effects on underlying groundwater.

15.115. No widespread contamination of soils or groundwater is expected at the site. Any contamination is likely to be localised around operational farm buildings and will be addressed

through a remediation strategy utilising best practice methodologies.

15.116. Further intrusive ground investigation will be completed to confirm ground conditions, assess the presence of any soil or groundwater contamination and obtain information for foundation design.

15.117. Nearby developments are subject to the same national guidance, with a requirement to deliver a safe development, including remediation of contamination where necessary, therefore, there are unlikely to be any significant cumulative impacts requiring mitigation.

15.118. Overall, it is considered that potential effects on the hydrogeological regime at the site from the construction and operational phases of the Proposed Development will be negligible to slight adverse following the implementation of appropriate mitigation measures.

Tritax Symmetry (Hinckley) Limited

HINCKLEY NATIONAL RAIL FREIGHT INTERCHANGE

Preliminary Environmental Information Report

Chapter 16: Geology, soils and contaminated land

January 2022

This document forms a part of a Preliminary Environmental Information Report (PEIR) for the Hinckley National Rail Freight Interchange project.

A PEIR presents environmental information to assist consultees to form an informed view of the likely significant environmental effects of a proposed development and provide feedback.

This PEIR has been prepared by the project promoter, Tritax Symmetry (Hinckley) Limited. The Proposed Development is described in Chapter 3 of the PEIR and is the subject of a public consultation running from 12 January to 9 March 2022.

Details of how to respond to the public consultation are provided at the end of Chapter 1 of the PEIR and on the project website:

http://www.hinckleynrfi.co.uk/

This feedback will be taken into account by Tritax Symmetry (Hinckley) Limited in the preparation of its application for a Development Consent Order for the project.

Chapter 16 ◆ Ground Conditions

INTRODUCTION

16.1. This PEIR Chapter considers the likely significance of the environmental impact of the Proposed Development on the geology, soils and contaminated land beneath the Main Order Limits Site and the local area. The PEIR has been undertaken in accordance with the requirements as set out within the National Policy Statement for National Networks, and with reference to relevant local plans and mineral safeguarding policies.

16.2. The PEIR Chapter is supported by the following appendices:

- Appendix 15.1 BWB Consulting Ltd for Tritax Symmetry (Hinckley) Ltd, Hinckley Rail Freight Interchange, Hinckley, Phase 1 Geo-Environmental Assessment Ref HNRFI-BWB-ZZ-XX-RP-YE-0001-Ph1-S1-P1.

- Appendix 15.2 Hydrock Consultants Limited. December 2018. 'Hinckley strategic Rail Freight Interchange – Ground Investigation Report', Ref 07700-HYD-XX-XX-RP-GE-1002-P1-S2.

METHODOLOGY AND DATA SOURCES

16.3. The PEIR assesses the likelihood of existing contamination being encountered during the construction process, such that it could cause significant environmental or health effects if not addressed adequately at the construction and/or operational stages. The construction will entail bringing materials onto site (such as fuel) which if spilt or leaked could result in land or groundwater contamination. Impairment and sterilisation of geological and mineral resources will likewise be addressed.

16.4. A risk-based approach in accordance with Defra[1] and the Environment Agency[2] (EA) guidance has been taken to assess contamination which may have a significant effect upon the construction and operation of the Proposed Development, or upon the wider environment as a consequence of the Proposed Development.

16.5. A desk study has been completed covering the Main Order Limits area with preliminary ground investigation has been undertaken at the Main HNRFI Site. Further ground investigation will be undertaken to support detailed earthworks and foundation design and to investigate areas that are currently inaccessible, for example operational areas with farm yards and adjacent to the railway and M69. Based on the predominantly greenfield

[1] Department for Environment, Farming and Rural Affairs; Environmental Protection Act 1990: Part 2A Contaminated Land Statutory Guidance; April 2012

[2] Land Contamination Risk Management (https://www.gov.uk/government/publications/land-contamination-risk-management-lcrm)

nature of the Main HNRFI Site there are unlikely to be significant pollutant linkages present at the Main HNRFI Site that would impact on the viability of the Proposed Development. Additional investigations will be completed following the making of any DCO and prior to construction works commencing on site in order to provide additional data to inform detailed design and associated mitigation. However, the preliminary GI undertaken is sufficient to allow adequate assessment for the purposes of the EIA Regulations.

16.6. With regards to sites of geological interest, information has been obtained from Natural England, the British Geological Survey, The Coal Authority and Blaby District Council, Leicestershire County Council, Hinckley and Bosworth Borough Council who hold information on such sites.

General approach and data sources

16.7. The general methodology for assessing effects followed standard procedures and involved the following desk-based and intrusive processes:

- Review of local, regional and national planning strategies and development plan policies (including, but not limited to, land contamination, aquifer protection, mineral resources).
- Review of published documents, current standards, and current best practice guidance.
- A reconnaissance of the Main HNRFI Site including the M69 junction area within the Main Order Limits, was completed in February 2018 and updated in August 2018, and the area of the A47 link corridor in May 2018 to confirm desk-based information and identify and confirm the current state and use of the site. No significant changes within the Main Order Limits are anticipated to have occurred since then.

16.8. Review of the following reports and information sources to provide site specific factual data upon geology, soils and groundwater and where available and relevant will also be used to support the development of the baseline ground model and assessment of baseline conditions.

- Groundsure reports, reference GSIP-2021-10711-3797 and HMD-214-7439283 included within the Phase 1 Reports (Appendices 15.1);
- 1:2,500 and 1:10,000 scale Historical Ordnance Survey Mapping,;
- Historical aerial photographs (Google Earth) and other imagery (Groundsure Report);
- British Geological Survey (BGS) 1:50 000 Scale, 'Coventry', Sheet 169, Solid and Drift, (1994);
- BGS online geological maps and exploratory hole records (www.bgs.ac.uk);

- MAGIC website (www.natureonthemap.naturalengland.org.uk/magicmap);
- Coal Authority Interactive Map Viewer (http://mapapps2.bgs.ac.uk/coalauthority/home.html);
- Regional unexploded bomb risk maps, (https://zeticauxo.com/downloads-and-resources/risk-maps/).
- 'Preliminary Desk Study – Hinckley Strategic Rail Freight Interchange'; by Hydrock for db Symmetry Ltd; ref. 07700-HYD-XX-XX-RP-GE-1001-S2-P1; dated 16th April 2019;
- Phase 1 Desk Study - Hinckley National Rail, Freight Interchange – A47 Link Road; by Hydrock for db Symmetry Ltd; ref: 07700-HYD-XX-XX-RP-GE-1006; dated 12th June 2019; and
- 'Preliminary Ground Investigation Report – Hinckley Rail Freight Interchange'; by Hydrock for db Symmetry Ltd; ref. 07700-HYD-XX-XX-RP-GE-1002; dated 14th June 2019.

16.9. Consultations with the EA groundwater protection team and Blaby District Council, Leicestershire County Council, Hinckley and Bosworth Borough Council, Nuneaton and Bedworth Borough Council contaminated land and mineral safeguarding officers and other relevant stakeholders undertaken throughout the process.

16.10. The assessment of effects has been undertaken using Qualitative Risk Assessment Matrices set out in Table 16.3 to 16.5 developed from the baseline condition ground model and updated to reflect the effect during both construction and operational phases.

16.11. The earthworks construction phase of the Proposed Development to be assessed will comprise a phased enabling works package to prepare development platforms, comprising the demolition of existing buildings, stripping of topsoil and bulk earthworks using site won materials and provision of primary infrastructure. Construction of buildings will follow in a number of phases. It is likely that the earthworks would be completed in a single phase including the earthworks for the M69 J2 improvements and the A47 Link road, rail sidings and construction of development platforms. Offsite Highway works are not likely to require further ground investigation.l

16.12. The key activities of the operational phase will comprise road and rail logistics, maintenance of vehicles and rail stock, and storage and distribution of goods.

16.13. Where necessary suitable mitigation options are detailed and their residual effect measured in the same manner using updated and extended qualitative risk assessment matrices to demonstrate the residual effect after mitigation.

16.14. Cumulative effects have been considered in accordance with the principles set out in Chapter 20 where other committed or proposed schemes developments are planned or being progressed that might affect the same receptors.

Consultation

16.15. A request for a scoping opinion was submitted to PINS in November 2020, with an opinion returned in December 2020. comments relating to Geology, Soils and Contaminated Land that were received are summarised in Table 16.1 below.

Table 16.1: 2020 Scoping Opinion

PINS ID	Ref	Comments	Response
4.10.2 15.10	Policy	Scoping Report lists the policies against which the assessment will be prepared. HBBC notes that 'Policy DM7: Preventing Pollution and Flooding' of the Site Allocations and Development Management Policies is also relevant.	Hinckley and Bosworth Council were consulted as part of the Phase 1 assessment. The assessment looks at potential for pollution of controlled waters from the Proposed Development in sections 16.111 to 16.113 and 16.127 to 16.128.
4.10.3 15.12	Consultation	The Inspectorate notes that the assessment will be supported and informed through consultations with various stakeholders. It should be clear in the ES how consultees comments have informed the assessment.	A list of stakeholder responses is presented in Table 16.2
4.10.4 15.15	Geographic scope	The Scoping Report states that additional surveys will be undertaken for the link roads. The ES must describe the baseline environment surrounding all relevant proposed works (including the works to the M69 Junction 3 /M1 Junction 21).	The Phase 1 Report (Appendix 15.1) covers the M69 Junction and A47 Link Road Corridors
4.10.5 15.14 – 15.18	Baseline	A figure or figures should be included in the ES to depict the location of any known areas of contamination and any	Figure 15.2 shows areas of potential contamination

PINS ID	Ref	Comments	Response
		geological sites of interest.	
4.10.6 15.22 15.55	Mitigation - construction effects	The Scoping Report states that remediation of contaminated land and other construction activities can lead to secondary effects and any such effects would be controlled through use of the construction Environmental Management Plan (CEMP). The ES should set out how the CEMP would manage any mitigation required with respect to potential adverse effects from construction of the Proposed Development. The ES should provide details of how any adverse effects on soils can be minimised.	This is noted The CEMP is discussed in Sections 16.117 to 16.121
4.10.7 15.23	Mitigation and monitoring - operation	The Scoping Report states that major operational sources of contamination are to be reviewed, and any appropriate mitigation measures proposed would be in line with the Land Contamination Risk Management (LCRM) assessment methodology. During the operational period, monitoring works may continue in order to demonstrate the effectiveness of any remedial works. The ES should demonstrate how mitigation and monitoring measures detailed in the ES would be secured	This is noted. If required a Remediation Strategy would incorporate any required long term monitoring and verification.

PINS ID	Ref	Comments	Response
		through the DCO.	
4.10.8 5.25- 15.42	Methodology - Preliminary Risk Assessment and Qualitative Risk Assessment	The ES should fully explain how the risk assessment including the Conceptual Site Model approach has been applied to identify potential impacts and any likely significant effects derived from construction and operation of the Proposed Development.	The methodology is set out in Sections 16.21 to 16.29 and 16.94 to 16.97 of the PEIR
4.10.9 15.43	Survey boundary	The study zone extending to 250m from the site boundary should be fully justified in the ES following consultation and agreement with relevant consultees where possible. The water resources study that will aid consideration of groundwater resources over a larger area for assessment of groundwater contamination effects should be clearly referenced and a clear explanation of the results should be provided to show how this has formed part of the assessment.	This is noted and the groundwater CSM will cross referenced with the Hydrogeology (Chapter 15) and Surface Water and Flood Risk (Chapter 14) Chapters. Environmental searches have been undertaken up to 2km from the Main Order Limits Site. Significant effects beyond the 500m buffer are unlikely considering the absence of significant contamination sources and the underlying Secondary Aquifer. The Main Order Limits Site is not within 1km of a Source Protection Zone.

16.16. The following regulatory bodies have been contacted to ascertain whether they hold any records which may be pertinent to the environmental risk assessment:

Table 16.2: Consultation responses

Stakeholder	Summary of Response	Action within PEIR
Environment Agency	No response received	
National Highways	Noted that the NH hold ground conditions information on the M69.	Noted for Future Geotechnical Design

Stakeholder	Summary of Response	Action within PEIR
	HD622 geotechnical reporting will be required for geotechnical design of highway improvements	Work
Forestry Commission	No response received	N/A
DEFRA	No response received	N/A
Historic England	No specific information held	N/A
Blaby District Council	Noted historic land uses and current land uses such as railway activities, fuel storage on existing farms and made ground which is associated with development of M69 and associated bridges.	Covered in Phase 1 Assessment and in Sections 16.90 to 16.91 of the PEIR
Leicestershire County Council	Searches confirmed no significant issues with respect to contaminated land associated with the site.	None
Hinckley and Bosworth Borough Council	Noted that Burbage Common is identified as an area of interest due to historical use a as a rifle range between 1885 and 1931. Burbage common is now not contained within the Main Order Limits boundary.	Not within the Main Order Limits. Noted on historical mapping west of Area 2.
Burbage Parish Council	No additional requirements above those set out in the scoping report	N/A
Elmesthorpe Parish Council	No response received	N/A

Study Area

16.17. The extent of the Study Area is the land within the proposed Main Order limits, , plus a buffer, extending to 500m from the DCO Site including land required for construction of compounds, construction/storage sites and other land required for the works. Ground and surface water abstractions and environmentally sensitive sites have been assessed within a 2km buffer from the Main Order Limits Site. The extent of this zone has been developed using professional judgement on the basis that contamination migration beyond this distance is likely to be minimal or could be mitigated and off site sources beyond this zone are unlikely to affect the DCO Site. Groundwater resources including abstractions and source protection zones within a 2km buffer have been considered in the assessment of groundwater contamination effects.

16.18. For the purposes of the assessment, the Main Order Limits Site has been split into three sections; Area 1 comprising the Main HNRFI site area, Area 2 comprising the A47 Link Road, Area 3 consisting of the M69 Junction 2 improvements, There are additional areas within the order limits that will be subject to offsite highway and rail crossing works, but will not require any significant physical works which are likely to affect ground conditions. The Areas are set out on Figure 15.1.

Identifying risks

16.19. In line with the *Land Contamination Risk Management*[3], the Preliminary Risk Assessment includes a geo-environmental Hazard Identification ('HAZID'), which seeks to list all the suspected contaminant sources, the receptors that might be harmed by those sources and the pathways via which the sources might reach the receptors to cause the harm. The source-pathway-receptor concept is known as a contaminant linkage (formerly a pollutant linkage) and only when a linkage is complete is there any possibility of risk of harm arising. The source-pathway-receptor concept will be assessed through production of a Conceptual Site Model ('CSM').

16.20. 15.19. Beneficial and adverse impacts have been identified, and options have been outlined for mitigating any potential adverse effects from the construction and operation. Cumulative effects of the Proposed Development in relation to other known committed or proposed schemes will also be addressed in accordance with the principles in Chapter 20 where necessary.

Determining the significance of effects

16.21. The approach described above forms the basis of the methodology used in the assessment. For contamination to present a significant potential effect a link must first be established within the CSM. The likelihood of a pollutant linkage must be demonstrated with an identifiable source (onsite or off site), a receptor and a viable pathway.

16.22. Potential sources have been identified from an assessment of current site uses and activities, review of historical mapping for former uses and a review of regulatory permits, consents and authorisations contained within the Groundsure report for the Main Order Limits Site for potentially contaminative sites such as landfills, environmental permits, pollution controls.

16.23. Pathways will be specific to the receptor type. For example, they could be:

- ingestion, inhalation, dermal contact for human health receptors;
- infiltration and contaminant migration through permeable strata such as the unsaturated zone for groundwater;
- a secondary pathway from groundwater contamination to surface water;
- migration of ground gases and vapours such as permanent gases, landfill gas and volatile hydrocarbons into buildings; and
- direct contact and uptake by plants.

16.24. The sensitivity of potential receptors can be described qualitatively according to the

[3] Land Contamination Risk Management (https://www.gov.uk/government/publications/land-contamination-risk-management-lcrm) is the governments primary guidance on the assessment and management of the risks from land contamination.

categories shown in Table 16.3.

Table 16.3: Criteria for assessing receptor sensitivity

Receptor sensitivity/ Value of Resource	Explanation	Receptor/ Resource
High	The receptor has low ability to absorb change without fundamentally altering its present character, is of high environmental value, or is of national importance.	Human health of users of residential areas, schools and playing fields, Surface water bodies of high quality e.g. main rivers and primary tributaries with good biological and/or chemical quality and/or Principal Aquifers Nationally designated areas e.g. Burbage Wood and Aston Firs SSSI, Aston Firs, Freeholt Wood and Sheepy Wood Ancient woodland Major strategic mineral resource areas, e.g. areas associated with a particularly high grade or quality resource or rare minerals. Grade 1 (Best and most versatile) Agricultural land
Moderate	The receptor has moderate capacity to absorb change without significantly altering its present character, has some environmental value, or is of regional importance.	Human health of users of retail and business parks (public and work places) Allotments and market gardens Surface water bodies of moderate quality, and/or Secondary A Aquifers Regionally designated areas e.g. Burbage Common & Woods local nature reserves or Local Geological Sites (LGS). Regionally or locally important mineral resource areas (MPA or MSA) Grade 2 (Best and most versatile) Agricultural land
Low	The receptor is tolerant of change without detriment to its character, is low environmental value, or local importance.	Human health of users of Commercial or industrial development Mineral Areas of Search/ Consultation Areas (MCA) Secondary B and undifferentiated aquifers Grade 3a (Best and most versatile) Agricultural land

16.25. The magnitude of land contamination effects are assessed by comparing all contaminant linkages at a baseline value (existing condition) to those during construction and operational circumstances. This provides a way of assessing adverse and beneficial effects through the project lifecycle. The magnitude will be assessed using a four-point scale as shown in Table 16.4.

Table 16.4: Effect magnitude criteria

Effect Magnitude	Criteria
High	Results in total loss of attribute and/or likely to cause exceedance of statutory objectives and/or breach of legislation.
Moderate	Results in effect on integrity of attribute/or loss of part of attribute, and/or possibly cause exceedance of statutory objectives and/or breach of legislation.
Low	Results in minor effects on attribute e.g. measurable effect but below a level that would breach legislative or statutory limits.
Negligible	Results in no change or effect on attribute

16.26. The assessment of significance is based on the magnitude of the effect and the importance or sensitivity of the receptors as set out below in Table 16.5. The significance of the potential effects is identified, as well as those of the residual effects for geological and mineral effects. Appropriate mitigation measures will be recommended in order to reduce/control any significant adverse effects on sensitive receptors. Once remediated, there should be no residual effects with respect to land contamination issues.

Table 16.5: Significance of effect matrix

Magnitude of Change	Sensitivity of Receptor			
	High	**Medium**	**Low**	**Negligible**
High	Major	Major / Moderate	Moderate	Slight
Medium	Major / Moderate	Moderate	Moderate / Slight	Slight
Low	Moderate	Moderate / Slight	Slight	Negligible
Negligible	Slight	Slight	Negligible	Negligible

16.27. Effects have the potential to be adverse, beneficial or neutral and temporary or permanent. For example, in terms of beneficial effects, the Proposed Development may remove a source of contamination or it may break a pathway that currently links a source to a receptor. The effects criteria are presented in Table 16.6.

16.28. The Duration of the effect is also considered.

- Short-term. Temporary effects related to a specific construction event of no more than a year's duration – such as the construction of an individual building or a specific element of infrastructure such as a section of road..

- Medium-term: Temporary effects of longer duration, such as those arising over an extended period of construction ranging from one year to the full construction period, envisaged to be ten years.

- Long-term. Permanent effects arising from the operation of the HNRFI or from the permanent presence or removal of physical features.

16.29. Effects of moderate or greater significance are considered to be significant in terms of the EIA. Where effects are considered as marginal, i.e. moderate/slight a precautionary approach has been adopted depending on the severity or likelihood of the effect., and further consideration given as to whether mitigation is necessary.

Table 16.6: Significance effect criteria

Significance	Description
Major adverse	Short term (acute) risk to human health likely to result in "significant harm" as defined by the Environment Protection Act 1990, Part IIA. Short term risk of pollution of sensitive water resource. Catastrophic damage to buildings/ property. A short-term risk to a particular ecosystem, or organism forming part of such ecosystem.
Moderate adverse	Chronic damage to Human Health ("significant harm"). Pollution of sensitive water resources. A significant change in a particular ecosystem, or organism forming part of such ecosystem.
Slight adverse	Pollution of non-sensitive water resources. Significant damage to crops, buildings, structures and services. Damage to sensitive buildings/structures/services or the environment.
Neutral	Effects, although not necessarily significant harm, which may result in a financial loss, or expenditure to resolve. Non-permanent health effects to human health (easily prevented by measures such as protective clothing etc.). Easily repairable effects of damage to buildings, structures and services.
Slight beneficial	Minor reduction in risk (slight, short or highly localised effect)
Moderate beneficial	Moderate reduction in risk, Improvement in water quality

Significance	Description
Major beneficial	Major reduction in risk

Limitations and assumptions

16.30. At the time of writing, access to the Main Order Limits Site to undertake a detailed Site walkover had not been granted to the author, and therefore descriptions of all areas of the Main Order Limits Site are based on previous reports by others, for the previous application. It is anticipated that access to the site will granted prior to submission of the ES. However, it is not expected that significant changes to the Main Order Limits Site will have occurred since the previous investigations were completed.

16.31. Intrusive ground investigation has only been completed within Area 1, the Main HNFRI Site and was limited to shallow trial pits and boreholes. Investigation of deeper strata and areas 2 and 3 will be completed as part of detailed design following submission of the ES. Nevertheless, the investigations completed are sufficient in scope to inform the assessment for the purposes of the EIA Regulations.

RELEVANT LAW, POLICY AND GUIDANCE

16.32. The applicable legislative framework for Contaminated Land is set out in Part 2A of the Environment Act 1990 and associated statutory guidance. Non statutory Guidance on management of Contaminated Land (Land Contamination Risk Management) is issued by the Environment Agency.

Part IIA of the Environmental Protection Act, (1990)[4]

16.33. Part IIA of the Environmental Protection Act, (1990) and the supporting statutory guidance describes a regulatory role for Local Authorities in dealing with contaminated land;

16.34. Environment Act, (1995) creates a system whereby Local Authorities must identify, and if necessary, arrange for the remediation of contaminated sites. The provisions are set out in Section 57, which inserts Part IIA into the Environmental Protection Act, 1990. In addition to these requirements, the operation of the regime is subject to regulation and statutory guidance;

16.35. The Act provides a definition of what constitutes 'contaminated land' and sets out the responsibilities of the Local Authority and the EA in the identification and management of contaminated land. Under the Regulations, contaminated land is defined as:

- 'land which is in the opinion of the Local Authority to be in such a condition by reason

[4] Department for Environment Food and Rural Affairs, Environmental Protection Act 1990: Part 2A, Contaminated Land Statutory Guidance; April 2012, https://www.gov.uk/government/publications/contaminated-land-statutory-guidance

of substances in or under the land that:

- Significant harm is being caused or there is significant possibility of significant harm being caused; and
- Significant pollution of controlled waters is being caused or there is a significant possibility of significant pollution of controlled waters being caused'.

16.36. Harm is defined in relation to harm to the health of living organisms or other interference with the ecological systems of which they form a part, and in the case of man includes harm to property. The potential for harm to occur requires three conditions to be satisfied:

- Presence of substances (potential contamination/pollutants) that may cause harm (source of pollution);
- The presence of a receptor which may be harmed e.g. the water environment or humans, buildings, fauna and flora (the receptor); and
- The existence of a linkage between the source and receptor (the pathway).

16.37. Therefore, the presence of measurable concentrations of contaminants within the ground and subsurface environment do not automatically imply that a contamination problem exists, since contamination must be defined in terms of pollutant linkages and unacceptable risk of harm.

16.38. The nature and importance of both pathways and receptors which are relevant to a particular site will vary according to the intended use of the site, its characteristics, and surroundings.

National Policy Statement for National Networks (NPSNN) 2014[5]

4.46 'Issues relating to discharges or emissions from a proposed project which affect air quality, water quality, land quality, and the marine environment, or which include noise and vibration, may be subject to separate regulation under the pollution control framework or other consenting and licensing regimes. Relevant permissions will need to be obtained for any activities within the development that are regulated under those regimes before the activities can be operated.

4.50 In deciding an application, the Examining Authority and the Secretary of State should focus on whether the development itself is an acceptable use of the land, and on the impacts of that use, rather than the control of processes, emissions or discharges themselves. They should assess the potential impacts of processes, emissions or discharges to inform decision making, but should work on the assumption that in terms of the control and enforcement,

[5] National Policy Statement for National Networks (NPSNN) 2014, Presented to Parliament pursuant to Section 9(8) and Section 5(4) of the Planning Act 2008, December 2014 https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/387223/npsnn-web.pdf

the relevant pollution control regime will be properly applied and enforced. Decisions under the Planning Act should complement but not duplicate those taken under the relevant pollution control regime.

4.55 The Secretary of State should be satisfied that development consent can be granted taking full account of environmental effects. This will require close cooperation with the Environment Agency and/or the pollution control authority, and other relevant bodies, such as the MMO, Natural England, Drainage Boards, and water and sewerage undertakers, to ensure that in the case of potentially polluting developments:

- *the relevant pollution control authority is satisfied that potential releases can be adequately regulated under the pollution control framework; and*
- *the effects of existing sources of pollution in and around the project are not such that the cumulative effects of pollution when the proposed development is added would make that development unacceptable, particularly in relation to statutory environmental quality limits.*

5.117 Where necessary, land stability should be considered in respect of new development, as set out in the National Planning Policy Framework and supporting planning guidance. Specifically, proposals should be appropriate for the location, including preventing unacceptable risks from land instability. If land stability could be an issue, applicants should seek appropriate technical and environmental expert advice to assess the likely consequences of proposed developments on sites where subsidence, landslides and ground compression is known or suspected. Applicants should liaise with the Coal Authority if necessary.

5.118 A preliminary assessment of ground instability should be carried out at the earliest possible stage before a detailed application for development consent is prepared. Applicants should ensure that any necessary investigations are undertaken to ascertain that their sites are and will remain stable or can be made so as part of the development. The site needs to be assessed in context of surrounding areas where subsidence, landslides and land compression could threaten the development during its anticipated life or damage neighbouring land or property. This could be in the form of a land stability or slope stability risk assessment report.

5.168 Applicants should take into account the economic and other benefits of the best and most versatile agricultural land (defined as land in grades 1, 2 and 3a of the Agricultural Land Classification). Where significant development of agricultural land is demonstrated to be necessary, applicants should seek to use areas of poorer quality land in preference to that of a higher quality. Applicants should also identify any effects, and seek to minimise effects, on soil quality, taking into account any mitigation measures proposed. Where possible, developments should be on previously developed (brownfield) sites provided that it is not of high environmental value. For developments on previously developed land, applicants should ensure that they have considered the risk posed by land contamination and how it is proposed to address this.'

5.169 Applicants should safeguard any mineral resources on the proposed site as far as possible.'

National Planning Policy Framework (NPPF) (2021)[6]

16.39. The National Planning Policy Framework (NPPF) (2021) sets out the Government's planning policies for England. It makes the following reference to Contaminated Land and ground conditions in the section entitled Conserving and enhancing the natural environment:

'174. Planning policies and decisions should contribute to and enhance the natural and local environment by:

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

f) remediating and mitigating despoiled, degraded, derelict, contaminated and unstable land, where appropriate.'

16.40. It also makes the following references to ground conditions and pollution:

'Planning policies and decisions should ensure that:

183 a) a site is suitable for its proposed use taking account of ground conditions and any risks arising from land instability and contamination. This includes risks arising from natural hazards or former activities such as mining, and any proposals for mitigation including land remediation (as well as potential impacts on the natural environment arising from that remediation);

b) after remediation, as a minimum, land should not be capable of being determined as contaminated land under Part IIA of the Environmental Protection Act 1990; and

c) adequate site investigation information, prepared by a competent person, is available to inform these assessments.

184. Where a site is affected by contamination or land stability issues, responsibility for securing a safe development rests with the developer and/or landowner.'

16.41. Assessment of the impact of the Proposed Development will also be undertaken in accordance with, but not limited to, the below policies:

[6] The National Planning Policy Framework (NPPF) was first published on 27 March 2012 and updated on 24 July 2018 and 19 February 2019. This sets out the government's planning policies for England and how these are expected to be applied. https://www.gov.uk/guidance/national-planning-policy-framework

- Blaby District Local Plan (Core Strategy) Development Plan, February 2013;
- Blaby District Local Plan (Delivery) Development Plan Document (DPD) Adopted February 2019;
- Hinckley and Bosworth Local Plan;
- District of Harborough, Harborough Local Plan 2011 to 2031, Adopted 30 April 2019
- Rugby Borough Council Local Plan 2011-2031 June 2019

16.42. Assessment of the impact of the Proposed Development will also be undertaken in accordance with, national guidance published by the Environment Agency:

- EA Guidance on Land Contamination Risk Management (LCRM); and
- EA Groundwater Protection Guidance.

Blaby District Council Local Plan Core Strategy[7]

Policy CS19 - Bio-diversity and geo-diversity

Strategic objectives

vi) To protect the important areas of the District's natural environment (species and habitats), landscape and geology and to improve biodiversity, wildlife habitats and corridors through the design of new developments and the management of existing areas by working with partners.

Blaby District Local Plan Delivery DPD – Adopted February 2019

Policy DM13 Land Contamination and Pollution

Land Contamination and Pollution

Development proposals will be required to clearly demonstrate that any unacceptable adverse impacts related to land contamination, landfill, land stability and pollution (water, air, noise, light and soils) can be satisfactorily mitigated.

For the following circumstances, development proposals will be supported where they are accompanied by a detailed investigation of the issues and appropriate mitigation measures are identified to avoid any adverse impact upon the site or adjacent areas:

a) Land that is (or has the potential to be) subject to land contamination or land stability

[7] Blaby District Local Plan, Local Plan (Delivery) Development Plan Document Adopted February 2019
Https://www.Blaby.Gov.Uk/Planning-And-Building/Local-Plan/Local-Plan-Delivery-Dpd/
Local Plan (Core Strategy) Development Plan Document Adopted February 2013
Https://www.Blaby.Gov.Uk/Media/4107/Adopted-Core-Strategy.Pdf

issues;

b) Close to an aquifer or surface water feature that may result in groundwater or surface water pollution;

c) Close to or within an air quality management area or key transport corridors that may be affected by air quality;

d) Close to a source of noise or light pollution and/or the proposal may be a source of noise or light pollution;

e) Soils of high environmental value, including best and most versatile agricultural land.

This policy seeks to ensure that development proposals are not affected by or cause land contamination or pollution.

Land contamination, landfill and land stability

4.62 The NPPF encourages the effective use of land by re-using land that has previously been developed. However, to prevent unacceptable risks from pollution and land.

4.63 The NPPF makes it clear that where a site is affected by contamination or land stability issues, responsibility for securing a safe development rests with the developer and/or landowner.

4.64 It is important that such sites are reclaimed to a level that is suitable for the future intended use and also that there is no contamination of water resources during the reclamation and redevelopment.

4.65 The geology of the District has resulted in mineral workings, with important resources of igneous rock, sand and gravel and clays. Currently, there is one extraction site, at Croft Quarry, which provides high quality granite. The legacy of mineral extraction has resulted in a number of disused quarries and workings, several of which have been reclaimed via landfill. A number of these were filled prior to the 1974 Control of Pollution Act and few records exist as to the nature of infill materials. Other sources of potential pollution or land contamination include historical industrial sites, current industrial sites and other previously developed contaminated sites. As a general rule, development proposals within 250m of a landfill or contaminated site will require investigation.

Water Quality

4.66 The Water Framework Directive requires member states, among other things, to prevent deterioration of aquatic ecosystems and protect, enhance and restore water bodies to 'good' status. It applies to all surface waters and underground water storage.

The Humber River Basin Management Plan provides a holistic framework to protect and enhance the benefits of the water environment to people, the economy and wildlife. It sets out the actions needed to tackle problems that are affecting water quality.

Hinckley and Bosworth Site Allocations and Development Management Policies DPD Plan adopted July 2016[8]

Policy DM7

Preventing Pollution and Flooding

Adverse impacts from pollution and flooding will be prevented by ensuring that development proposals demonstrate that:

a) It will not adversely impact the water quality, ecological value or drainage function of water bodies in the borough;

b) Appropriate containment solutions for oils, fuels and chemicals are provided;

c) All reasonable steps are taken through design, siting and technological solutions to ensure the abatement of obtrusive light to avoid sky glow, glare and light intrusion;

d) It would not cause noise or vibrations of a level which would disturb areas that are valued for their tranquillity in terms of recreation or amenity;

e) Appropriate remediation of contaminated land in line with minimum national standards is undertaken;

f) It will not contribute to poor air quality;

g) It will not result in land instability or further intensify existing unstable land; and

h) The development doesn't create or exacerbate flooding by being located away from areas of flood risk unless adequately mitigated against in line with National Policy.

District of Harborough, Harborough Local Plan 2011 to 2031, Adopted 30 April 2019[9]

GD8 Good design in development

1. Development will be permitted where it achieves a high standard of design, including meeting the following criteria:

n. where the site has previously been developed:

i. identifying the need for any decontamination and implementing this to an agreed programme; and

ii. ensuring that any contamination is not relocated elsewhere to a location where it could adversely affect the water environment or other wildlife habitats.

[8] Hinckley and Bosworth Borough Council, Local Plan 2006-2026, Site Allocations and Development Management Policies DPD, adopted July 2016.
[9] District of Harborough, Harborough Local Plan 2011 to 2031, Adopted 30 April 2019

GI5 Biodiversity and geodiversity

1. Nationally and locally designated biodiversity and geodiversity sites, as shown on the Policies Map, will be safeguarded.

2. Development will be permitted where:

a. there is no adverse impact on:

iii nationally designated sites;

iv. locally designated sites;

unless, in all cases, the need for, and benefits of, the development in that location clearly outweigh the impact.

b. there is no loss of any 'best and most versatile agricultural land' unless this is demonstrably necessary to facilitate the delivery of sustainable development;

c. there is no net loss or sterilisation of natural resources;

IN4 Water resources and services

Water resources will be protected and water services provided. Development will be permitted where it would: b. not adversely affect ground water quality by preventing potential sources of water pollution within Source Protection Zones (as identified on the Policies Map);

e. ensure the removal of any contamination from the site and that the development would not result in the migration of any contamination to a location where it could have an adverse affect upon the water environment;

Rugby Borough Council Local Plan 2011-2031 June 2019[10]

Policy SDC7: Protection of the Water Environment and Water Supply

Development will not be permitted where proposals have a negative impact on water quality, either directly through pollution of surface or ground water.

Development will not be permitted where the sensitivity of the groundwater environment, or the risk posed by the type of development is deemed to pose an unacceptable risk of pollution of the underlying aquifer.

[10] Rugby Borough Council Local Plan 2011-2032 June 2019

BASELINE CONDITIONS

Site description

16.43. The Main Order Limits Site comprises an irregular shaped plot of land which is currently utilised for agricultural purposes, comprising fields and farm buildings, and includes sections of the local road and rail network.

16.44. The topography is variable with elevation ranging between c. 83m above Ordnance Datum (AOD) in the north beside the railway to c. 110m AOD at the M69 J2 motorway roundabout in the south, with levels of c. 93m AOD to 99m AOD in the A47 Link Road Corridor west of the Main Order Limits Site, c. 91m AOD in the east and c. 100m AOD in the centre of the Main HNRFI Site. The topography generally increases in elevation from north east to south west, with a slight ridge feature through the centre of the Main HNRFI Site orientated broadly in a south west to north east direction.

16.45. For the purposes of this section, the Main Order Limits Site has been split into three sections; Area 1 comprising the Main HNFRI Site, Area 2 comprising the arm to the north west containing the A47 Link Road Corridor, and Area 3 consisting of the M69 Junction 2 arm. The Areas are set out on Figure 15.1. Detailed walkover was completed in 2018 and it is not anticipated that any significant changes to the Main Order Limits Site will have occurred since then. At the time of writing, access for further site walkover and investigation has not been arranged but access for further investigations will be granted before submission of the ES.

16.46. The negligible impact of the off-site Highway works outside of the Mian Order Limits means much of the PEIR chapter relates to the Main Order Limits Site.

Area 1 – Main HNRFI Site Area

16.47. Area 1 comprises a large area of agricultural land, with Woodhouse Farm at the centre. The farm complex comprises several residential premises, agricultural outbuildings and barns, and small commercial premises including a farm shop and vehicle repair shop. Three oil tanks, a diesel tank and a propane tank were noted on site during a walkover conducted in August 2018, with several corrugated roofs indicated to have been constructed from potentially asbestos containing materials (ACMs).

16.48. A small property utilised for kennelling services is located to the north west of 'Woodhouse Farm'. 'Hobbs Hayes Farm' is located to the south of Woodhouse Farm, with additional farm buildings, labelled 'Freeholt Lodge', located towards the southern extent of Area 1. Two tanks were identified at Hobbs Hayes Farm during the 2018 walkover utilised for diesel and heating oil storage. ACMs were tentatively identified in four barn rooves. Freeholt Lodge appeared to be disused with static caravans, tanks, and abandoned vehicles noted. A propane tank was noted, and ACMs also identified.

16.49. Burbage Common Road runs east to west through Area 1 past Woodhouse Farm, before joining Stanton Road at the north east boundary. At the north western boundary Burbage Common Road crosses a bridge over the railway line. Smaller tracks also crossed Area 1 to

the south west of Woodhouse Farm and to the south away from Hobbs Hayes Farm.

16.50. Drainage ditches run along most field boundaries, with several small ponds located at various points around the field boundaries. A small stream flows across the south of Area 1.

16.51. Area 1 is bound to the south east by the M69 and to the north west by a railway line. To the south west of site are three wooded areas known as Burbage Wood, Aston Firs and Freeholt Wood, with two mobile homes sites and agricultural land beyond. Burbage Common and Woods are located to the west. Sporadic farm buildings and residential premises are located to the north of Area 1, mainly along Station and Stanton Road.

Area 2 – A47 Link Road Corridor

16.52. Area 2 comprises a strip of land to the north west of Area 1, extending from the railway line to the B4668 (Leicester Road), with Burbage Common Road also crossing this location. The rest of Area 2 is occupied by fields, with a small densely vegetated stream crossing the north of Area 2 and a drain crossing the central area. Small farm outbuildings are present in some of the north western fields.

16.53. Area 2 is bound by the railway line to the south east and Leicester Road to the north west. Immediately west of Area 2 are agricultural fields and Burbage Common, whilst fields and Bride Farm are located to the east. A sports club is located to the north west of Leicester Road.

Area 3 – M69 Junction 2 Improvements

16.54. Area 3 largely covers the road network around Junction 2 of the M69. Junction 2 provides access to the northbound M69, and egress from the southbound carriageway. The entry/exit ramps lead up to a raised roundabout over the M69 which involved two bridge crossings. Hinckley Road (B4669) joins the roundabout orientated in a west to east direction.

16.55. The boundary of Area 3 covers the roundabout, the northern slip roads, the access points to Hinckley Road, and extends to the south west beyond the point where Aston Lane crosses over the M69. The north eastern extent to Area 3 incorporates a small bridge which provides access for pedestrians and farm vehicles to cross the M69.

16.56. The M69 was predominantly raised above site levels and increases in topography from north east to south west from c. 96m AOD to c. 100m AOD. South-west of M69 Junction 2 the M69 motorway falls gently to a height of c. 96m AOD at the southern extremity of the DCO Site. and.

16.57. A small stream was culverted under the M69 towards the south of the Area 3. Also, a pond is located immediately west of the M69 which appears to have been constructed at the same time as the motorway and is likely to be an attenuation basin as part of the drainage network.

16.58. The surrounding land use is predominantly agricultural, with two mobile homes sites located to the north west of Junction 2 and Averley House Farm to the north east.

Site history

16.59. Historical Ordnance Survey (OS) mapping for the Main Order Limits Site area has been reviewed. These maps and plans date from 1886 to 2014. The key points of the historical development of the Main Order Limits Site and surrounding area are summarised in Table 16.7. All distances quoted are approximate.

Table 16.7: Key points of development history

Dates	On Site (Main Order Limits including HNRFI Site and A47, M69 sliproads)	Off-Site (outside Main Order Limits)
Potential **SOURCES** in bold and caps. Potential ***Receptors*** in bold and italics.		
1886 – 1938	The earliest site plans show the site as largely undeveloped, agricultural land, relatively similar to present day. **WOODHOUSE FARM** is present in the centre of the site with **HOBBS HAYES FARM** to the south. The **RAILWAY LINE** is mapped in the north west of the site. Numerous small ***ponds*** are mapped across the site with small ***streams*** mapped in the north, central and south of site along the same course as present day.	**ELMESTHORPE RAILWAY STATION** is mapped immediately north east of Area 1, with several **SIDINGS**. ***Old fish ponds*** are mapped c. 100m north of site and indicated to be excavations. A **BRICK WORKS** with associated **KILNS** are mapped adjacent to Hinckley Road immediately south east of Area 3, and also approximately 500m west of Area 1. Small scale associated clay pits are also indicated at the brick works. A rifle range is present immediately west of Area 2. ***Burbage Common***, ***Sheepy Wood***, ***Burbage Wood***, ***Aston Firs***, and ***Freeholt Wood*** are all located immediately west of Area 1 and 2. Both brick yards appear to be disused from 1901 plans, with the south eastern clay pit indicated to have been reduced to a small pond by 1963.
1950 - 1968	1963 plans show the B4669 (labelled as A5070) Hinckley Road as realigned. 1962 plans label the track to Woodhouse Farm as Burbage Common Road for the first time.	Residential development is mapped along Station Road 200-600m north east of Area 1. A **TANK** is indicated at the railway station from 1962 plans with a **FACTORY** mapped 200m north east of site. A **GARAGE** is mapped 400m south west of Area 3 on 1963 plans.
1977 - 1994	No significant changes noted.	The **M69** and associated access bridges have been constructed. Hinckley Road in the south of Area 3 is realigned as part of the M69 works, and the attenuation pond is constructed.

Dates	On Site (Main Order Limits including HNRFI Site and A47, M69 sliproads)	Off-Site (outside Main Order Limits)
		Elmesthorpe Railway Station and sidings are no longer mapped from 1983 plans. The buildings remain, but the tank is no longer labelled. 1984 plans show an **ELECTRICITY SUBSTATION** mapped 200m north of site. 1994 plans indicate the former railway sidings site is occupied by a **SCRAP YARD**.
2002 – Present day	No significant changes noted.	The sports ground to the north west of Area 2 has been developed by 2002 plans. The eastern traveller site appears on mapping from 2002 with the western site mapped from 2010.

Ground conditions

Superficial deposits

16.60. Information published by the BGS has mapped localised Made Ground[11] at the Main Order Limits Site. Made Ground is mapped along the M69 corridor and partially along the railway line, indicating areas which have been artificially raised. There are indicated areas of cut where the M69 passes under the roundabout, and the attenuation basin located to the west of Area 3.

16.61. The BGS data has recorded several superficial deposit[12] units across the Main Order Limits Site, and also some areas where superficial deposits are absent.

16.62. The Bosworth Clay Member, also known as Wolston Clay, and Thrussington Member are mapped underlying most of the Main Order Limits Site, with the latter present towards to the south and south east of Area 1. The Bosworth Clay Member is typically encountered as variable grey and red-brown clays and silt, often without gravels, whilst the Thrussington Member is encountered as brown to reddish brown usually sandy silty clay with gravels present.

16.63. Deposits of the Wolston Sand & Gravel Member, also referenced as Glaciofluvial Deposits, are mapped in two locations in the centre of Area 1. These are younger deposits commonly encountered as yellow or red sand and gravel.

[11] Made Ground defined as anthropogenic (mand made) ground in which the material has been placed without engineering control and/or manufactured by man in some way, such as through crushing or washing, or arising from an industrial process.

[12] Superficial deposits refer to geological deposits typically of Quaternary age. These geologically recent unconsolidated sediments may include stream channel and floodplain deposits, beach sands, talus gravels and glacial drift and moraine. All pre-Quaternary deposits are referred to as bedrock.

16.64. Localised Alluvium is mapped in the north and north east of Area 1 along the line of the stream and also along the watercourses in Area 2.

16.65. Superficial deposits are locally absent in the south east and east of Area 1, and across much of Area 2.

16.66. Small pockets of the Oadby Member are mapped in the central area. The Oadby member comprises Diamicton encountered as grey/ brown gravelly clay with subordinate lenses of sand and gravel, clay and silt.

Bedrock deposits

16.67. The bedrock underlying the main Main Order Limits site (Areas 1-3) is indicated to comprise the Edwalton Member of the Mercia Mudstone. Mercia Mudstone is commonly encountered as red, or occasionally green-grey, mudstones and subordinate siltstones. The bedrock contains thick halite-bearing units in some basinal areas and thin beds of gypsum/anhydrite are widespread.

Third party investigation logs

16.68. The preliminary ground investigation conducted by Hydrock[13] generally confirmed the published geological sequences, with Bosworth Clay was found across much of Area 1 (excluding the central areas) and across the south of Area 3, and the Thrussington Member was recorded predominantly in the centre of Area 1 and across the northern parts of Area 3.

16.69. Limited Made Ground was encountered, predominantly around the farm complexes.

16.70. Localised Alluvium was recorded near to the watercourse flowing through Area 1. The Wolston Sand & Gravel Member was not recorded. Mercia Mudstone was recorded under the Glacial Deposits in the eastern areas, but not to the west of Area 1 or in Area 3.

Aquifer designation

16.71. The EA classifies the Alluvium and the Wolston Sand and Gravel as 'Secondary A Aquifers'. Secondary A Aquifers are permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers.

16.72. The Bosworth Clay Member is an unproductive stratum, defined as rock layers or drift deposits with low permeability that have negligible significance for water supply or river base flow.

16.73. The Thrussington Member is an undifferentiated Secondary Aquifer which has been assigned in cases where it has not been possible to attribute either a Secondary A or B

[13] Hydrock Consultants Limited. December 2018. 'Hinckley strategic Rail Freight Interchange – Ground Investigation Report', Ref 07700-HYD-XX-XX-RP-GE-1002-P1-S2.

category to a rock type.

16.74. The Mercia Mudstone is categorised as a Secondary B Aquifer which are defined as predominantly lower permeability layers which may store and yield limited amounts of groundwater due to localised features such as fissures, thin permeable horizons, and weathering.

16.75. The Main Order Limits Site is not located within an EA designated groundwater Source Protection Zone. The Main Order Limits Site lies within the Soar Secondary Combined Water Framework Directive Groundwater Body which recorded a good chemical and overall rating in 2015.

16.76. Significant groundwater ingress was not recorded during the ground investigation. Groundwater was not recorded in any trial pit and in only 4 of the window sampler boreholes during the investigation at depths of between 3.1m and 3.9m bgl within the Thrussington Member and Mercia Mudstone.

16.77. Post investigation monitoring of boreholes recorded sporadic groundwater across the HNRFI Site within the Thrussington Member, Boswoth Clay Member and Mercia Mudstone at depths of 0.83m to 4.5m bgl.

Surface water features

16.78. Within Area 1, drainage ditches run along most field boundaries, with several small ponds located at various points around the field boundaries. A small stream flows across the south of Area 1, and two small streams are present in the north of Area 1, flowing off site to the north.

16.79. Within Area 2, three small watercourses cross the site, with the southernmost appearing to have been channelised.

16.80. Within Area 3, a small drain is culverted under the M69.

16.81. The River Soar is mapped 175m south east of site.

Ground gas and radon

16.82. The localised Made Ground and Alluvium mapped across the Main HNRFI represent a possible source of ground gas, however, generation rates are likely to be low. These materials may be relocated if present under proposed building footprints.

16.83. Ground gas monitoring completed between October and December 2018 has indicated generally low concentrations across much of the Main HNRFI site, however, localised elevated carbon dioxide was recorded at one location. The assessment suggested that a Characteristic Situation 2 (CS2) classification would be appropriate around Woodhouse Farm where the carbon dioxide was encountered.

16.84. The Main HNRFI Site is located in an area where less than 1% of properties are affected by Radon and so is not considered a risk.

Mineral extraction

16.85. The Main Order Limits Site is not located within an area associated with coal mining or within a mineral safeguarding area.

16.86. Small clay pits have been recorded off site to the west of Area 2 and east of Area 3 , however, no records indicate workings on site.

16.87. The Groundsure Report (included in Appendix 15.1) references numerous cuttings observed from historical mapping, relating to localised area of the M69 and railway line.

16.88. Limited historical development has occurred at the Main Order Limits Site over the reviewed mapping period. Several farms have been present on site since pre 1880s, with streams and fields crossing the Main Order Limitsite. A railway station, electricity substation, tank, scrap yard, small brick works and two landfill sites have been recorded in the surrounding area.

Agricultural Land Classification

16.89. The Main HNRFI Site is classified as Grade 3 (good to moderate) Quality Agricultural land which is further subdivided into 3a good quality and 3b moderate quality. Grade 3a is considered as best and most versatile (bmv) land. Detailed assessment of the agricultural land classification of Areas 1 and 3 is presented in Appendix 11.3. Figure 11.19 shows the results of detailed assessment of Area 1 and Area 3 which shows the vast majority of the site is Grade 3b poor with a small pocket (approximately 2.9ha) of Grade 3a land in the north of the site.

Soil and groundwater contamination

16.90. The Phase 1 Assessments (Appendix 15.1) and preliminary ground investigation (Appendix 15.2) concluded that limited potential contamination sources had been identified at the Main Order Limits Site. The contamination source within each area are described below.

Area 1 Main HNRFI Site

- Made Ground predominantly located around farm complexes could contain heavy metals, hydrocarbons, asbestos and a potential source of hazardous ground gasses.
- Asbestos within farm buildings and in shallow soils around farm buildings.
- Hydrocarbons, lubricants and solvents located around tanks.
- Pesticides and herbicides within fields and along railway lines and in storage areas within farm complex.
- Organic rich Alluvium could represent a potential source of hazardous ground gasses.
- Biological contamination associated with cess pit (e.g. e-coli).

Area 2 A47 Link Road

- Made Ground predominantly located around farm buildings could contain heavy metals, hydrocarbons, asbestos and a potential source of hazardous ground gasses.
- Asbestos within farm buildings and shallow soils around farm buildings.
- Pesticides and herbicides within fields and along railway lines and in storage areas within farm complex.
- Organic rich Alluvium could represent a potential source of hazardous ground gasses.

Area 3 M69 Junction 2 Improvements

- Made Ground at the site related to the construction of the road network. could contain heavy metals, hydrocarbons, and a potential source of hazardous ground gasses.
- Organic rich Alluvium could represent a potential source of hazardous ground gasses.

Off Site Outside Main Order Limits Boundary

- Railway station and subsequently scrap yard - potential source of heavy metals, hydrocarbons, volatile compounds, and hazardous ground gasses.
- Landfill – potential for leachate migration towards site.
- Organic rich Alluvium could represent a potential source of hazardous ground gasses.
- Electricity substation located 200m north represents potential source of oils and PCBs, not a potential source If it dates from 1980s onwards.

16.91. The following potential sources are not included within the conceptual site model:

- Infilled brick pits - potential source of hazardous ground gasses, however, they are located near to the proposed road structures rather than buildings. They are located too far from proposed buildings to represent a risk.
- Landfill – Potential ground gas risk associated with landfills is discounted as they are located too far from proposed buildings to represent a risk.

Receptors

16.92. The following potential human health and environmental receptors have been identified at the Main Order Limits Site and surrounding area. Groundwater receptors are considered in the Hydrogeology chapter:

On Site

- Underlying Secondary A Aquifer – Wolston Sand and Gravel
- Underlying Secondary A Aquifer – Alluvium
- Underlying undifferentiated Secondary Aquifer – Thrussington and Oadby Members
- Underlying Secondary B Aquifer – Mercia Mudstone
- Field drainage systems and streams
- Ponds
- Future site users
- Ground Workers during construction
- Intrusive maintenance works
- Future Buildings
- Flora and Fauna

Off Site

- Wider Secondary A Aquifer – Alluvium and Wolston Sand and Gravel
- Wider undifferentiated Secondary Aquifer – Thrussington Member
- Wider Secondary B Aquifer – Mercia Mudstone
- Surface water receptors – off site, downstream watercourses including River Soar
- SSSI, Ancient Woodlands and Local Nature Reserves

16.93. The Conceptual Site Model presented in Table 16.13 recorded limited pollutant linkages with a low to very low risk to human health.

16.94. The methodology for risk evaluation is a qualitative method for interpreting the output for the risk estimation stage of the assessment. It involves the classification of the:

- Magnitude of the potential consequence (severity) of risk occurring
- Magnitude of the probability (likelihood) of the risk occurring

Table 16.9: Risk evaluation matrix

		Consequence			
		Severe (Sv)	Medium (Md)	Mild (Mi)	Minor (Mr)
Probability	High likelihood (Hi)	Very high risk (VH)	High Risk (H)	Moderate Risk (M)	Mod/low risk (M/L)
	Likely (Li)	High risk (H)	Moderate risk (M)	Mod/low risk (M/L)	Low risk (L)
	Low likelihood (Lw)	Moderate risk (M)	Mod/low risk (M/L)	Low risk (L)	Very low risk (VL)
	Unlikely (Ul)	Mod/low risk (M/L)	Low risk (L)	Very low risk (VL)	Very low risk (VL)

Table 16.10: Risk categorisations

Very high risk (VH)	There is a high probability that severe harm could arise to a designated receptor from an identified hazard, OR, there is evidence that severe harm to a designated receptor is currently happening. This risk, if realised, is likely to result in a substantial liability. Urgent investigation (if not undertaken already) and remediation are likely to be required.
High risk (H)	Harm is likely to arise to a designated receptor from an identified hazard. Realisation of the risk is likely to present a substantial liability. Urgent investigation (if not undertaken already) is required and remedial works may be necessary in the short-term and are likely over the longer-term.
Moderate risk (M)	It is possible that harm could arise to a designated receptor from an identified hazard. However, it is either relatively unlikely that any such harm would be severe, or if any harm were to occur it is more likely that the harm would be relatively mild. Investigation (if not already undertaken) is normally required to clarify the risk and to determine the potential liability. Some remedial works may be required in the longer-term.
Low risk (L)	It is possible that harm could arise to a designated receptor from an identified hazard, but it is likely that this harm, if realised, would at worst normally be mild.
Very low risk (VL)	There is a low possibility that harm could arise to a receptor. In the event of such harm being realised it is not likely to be severe.

Table 16.11: Classification of consequence

Classification	Definition	Examples
Severe (Sv)	Short term (acute) risk to human health likely to result in "significant harm" as defined by the Environment protection Act 1990, Part IIA. Short term risk of pollution of controlled waters. Catastrophic damage to buildings/property. A short-term risk to a particular ecosystem, or organism forming part of such ecosystem	High concentrations of cyanide on the surface of an informal recreation area Major spillage of contaminants from site into controlled water. Explosion causing building collapse (can also equate to a short term human health risk if buildings are occupied.)
Medium (Md)	Chronic damage to Human Health ("significant harm"). Pollution of controlled waters. A significant change in a particular ecosystem, or organism forming part of such ecosystem.	Concentrations of contaminants from site exceeding generic or site specific screening criteria Leaching of contaminants into a major or minor aquifer. Death of species within a designated nature reserve.
Mild (Mi)	Pollution of non-sensitive water resources. Significant damage to crops, buildings, structures and services. Damage to sensitive buildings/structures/services or the environment	Pollution of non-classified groundwater Damage to building rendering it unsafe to occupy. (e.g. foundation damage resulting in instability)
Minor (Mr)	Harm, although not necessarily significant harm, which may result in a financial loss, or expenditure to resolve. Non-permanent health effects to human health (easily prevented by measures such as protective clothing etc). Easily reparable effects of damage to buildings, structures and services	The presence of contaminants at such concentration that protective equipment is required during site works. The loss of plants in a landscaping scheme. Discolouration of concrete.

16.95. The classification of consequence does not take into account the probability of the consequence being realised. Therefore there may be more than one consequence for a particular pollutant linkage. Both a severe and medium classification can result in death. Severe relates to short term (acute) risk while medium relates to long term (chronic) risk. Mild relates to significant harm but to less sensitive receptors. Minor classification relates to harm which is not significant but could have a financial cost.

Table 16.12: Classification of probability

Classification	Definition
High likelihood (Hi)	There is a pollutant linkage and an event that either appears very likely in the short term and almost inevitable in the long term, or there is evidence at the receptor or harm or pollution
Likely (Li)	There is a pollutant linkage and all the elements are present and in the right place, which means that it is probable that an event will occur. Circumstances are such that an event is not inevitable, but possible in the short term and likely over the long term.
Low likelihood (Lw)	There is a pollutant linkage and circumstances are possible under which an event could occur. However, it is by no means certain that even over a longer period such event would take place and is less likely in the short term.
Unlikely (Ul)	There is a pollutant linkage but circumstances are such that it is improbable that an event would occur even in the very long term.

16.96. The classification gives a guide as to the severity and consequence of identified risk when compared with other risk presented on the Main Order Limits Site. It should be noted that if a risk is identified it cannot be classified as "no risk" but as "very low risk".

16.97. The risk to controlled waters was considered to be low based on the potential for contaminants associated with the Made Ground at the Main Order Limits Site to impact upon the underlying aquifer or on-site surface water receptors. This is discussed further in Chapter 15: *Hydrogeology*.

Table 16.13: Conceptual Site Model

Source	Pathway	Receptor	Consequence	Probability	Risk	Potential Mitigation/Investigation Requirements
Area 1 – Main HNRFI Site						
Made Ground at the site related to the	Dermal contact with, and incidental ingestion or inhalation of	Future commercial site users	Mi	Ul	VL	Preliminary ground investigation works have not recorded contaminants above commercial screening levels.

Source	Pathway	Receptor	Consequence	Probability	Risk	Potential Mitigation/Investigation Requirements
construction of the road network and around farm buildings. could contain heavy metals, hydrocarbons, biological contamination (eg, e-coli) and a potential source of hazardous ground gasses.	soil and/or dust.	Intrusive maintenance workers	Mi	Ul	VL	The Proposed Development is likely to have limited areas of soft landscaping, so a pathway to future site users is unlikely to be realised. If contaminants are encountered at the site as part of more detailed investigation works, the risk to future site users could be mitigated by the incorporation of clean capping layers in soft landscaped areas. The exposure of intrusive maintenance workers can be mitigated by the adoption of suitable working methods, utilising appropriate personal protective equipment (PPE) and maintaining good hygiene.
	Inhalation of vapours	Future commercial site users	Mi	Ul	VL	A vapour risk has not been identified by the preliminary ground investigation data. If volatiles are identified in soils, a risk assessment will be undertaken to determine if mitigation is required. The exposure of intrusive maintenance workers can be mitigated by the adoption of suitable working methods, utilising appropriate personal protective equipment (PPE)
		Intrusive maintenance workers	Mi	Ul	VL	
	Migration and accumulation of ground gases in enclosed spaces leading to asphyxiation (carbon dioxide) or explosion (methane).	Future commercial site users	Md	Ul	L	Preliminary ground investigation has identified low gas concentrations, with most of the site indicated to be CS1 whereby gas protection measures are not required. One isolated occurrence of elevated carbon dioxide was recorded. Further gas monitoring is required to determine whether gas protection measures are required.
	Leaching and permeation through soil profile.	Underlying Secondary Aquifers	Md	Ul	L	Preliminary ground investigation works have not identified a significant risk to controlled waters. The soils at site are predominantly cohesive, so any contaminant hotspots are likely to be localised, and unable to freely migrate through the aquifers. Development of the site will facilitate remedial works, which would reduce the risk to controlled waters.
	Vertical and lateral migration of contaminants.		Md	Ul	L	
	Lateral migration of contaminated groundwater.	Wider Secondary Aquifers	Md	Ul	L	

Source	Pathway	Receptor	Consequence	Probability	Risk	Potential Mitigation/Investigation Requirements
	Surface run-off.	Field drainage system and streams	Mi	Ul	VL	
	Lateral migration of contaminated groundwater and root uptake	Off site SSSI, Ancient Woodlands and Local Nature Reserves	Md	Ul	L	The woodlands represent a sensitive receptor, however, Made Ground with potentially elevated contaminants has not been recorded near to the woodland receptors. The soils at site are predominantly cohesive, so any contaminant hotspots are likely to be localised, and unable to freely migrate through the aquifers. Development of the site will facilitate remedial works, which would reduce the risk to controlled waters.
Asbestos within shallow soils around farm buildings;	Inhalation of dust and/or fibres	Future commercial site users	Mi	Ul	VL	Preliminary ground investigation works recorded asbestos within 1 of 43 samples, with a quantification of <0.001%. Asbestos containing materials on buildings should be removed from site by a competent asbestos removal contractor. The risk to future site users is minimal based on the predominantly hardstand nature of the Proposed Development. The exposure of intrusive maintenance workers can be mitigated by the adoption of suitable working methods, utilising appropriate personal protective equipment (PPE) and maintaining good hygiene.
		Intrusive maintenance workers	Mi	Ul	VL	
Hydrocarbons, lubricants and solvents located around tanks;	Dermal contact with, and incidental ingestion or inhalation of soil and/or dust.	Future commercial site users	Mi	Ul	VL	Preliminary ground investigation works have not recorded contaminants above commercial screening levels. The Proposed Development is likely to have limited areas of soft landscaping, so a pathway to future site users is unlikely to be realised. If contaminants are encountered at the site as part of more detailed investigation works, the risk to future site users could be mitigated by the incorporation of clean capping layers in soft landscaped areas. The exposure of intrusive maintenance workers can be mitigated by the adoption of suitable working methods, utilising appropriate personal protective equipment (PPE) and maintaining good hygiene.
		Intrusive maintenance workers	Mi	Ul	VL	
	Inhalation of vapours	Future commercial site users	Mi	Ul	VL	A vapour risk has not been identified by the preliminary ground investigation data. If volatiles are identified in soils, a risk assessment will be

Source	Pathway	Receptor	Consequence	Probability	Risk	Potential Mitigation/Investigation Requirements
		Intrusive maintenance workers	Mi	Ul	VL	undertaken to determine if mitigation is required. The exposure of intrusive maintenance workers can be mitigated by the adoption of suitable working methods, utilising appropriate personal protective equipment (PPE)
	Migration and accumulation of ground gases in enclosed spaces leading to asphyxiation (carbon dioxide) or explosion (methane).	Future commercial site users	M d	Ul	L	Preliminary ground investigation has identified low gas concentrations, with most of the site indicated to be CS1 whereby gas protection measures are not required. One isolated occurrence of elevated carbon dioxide was recorded. Further gas monitoring is required to determine whether gas protection measures are required.
	Leaching and permeation through soil profile.	Underlying Secondary Aquifers	M d	Ul	L	Preliminary ground investigation works have not identified a significant risk to controlled waters. The soils at site are predominantly cohesive, so any contaminant hotspots are likely to be localised, and unable to freely migrate through the aquifers. Development of the site will facilitate remedial works, which would reduce the risk to controlled waters.
	Vertical and lateral migration of contaminants.		M d	Ul	L	
	Lateral migration of contaminated groundwater.	Wider Secondary Aquifers	M d	Ul	L	
	Surface run-off.	Field drainage system and streams	Mi	Ul	VL	
	Lateral migration of contaminated groundwater and root uptake	Off site SSSI, Ancient Woodlands and Local Nature Reserves	M d	Ul	L	The woodlands represent a sensitive receptor, however, Made Ground with potentially elevated contaminants has not been recorded near to the woodland receptors. The soils at site are predominantly cohesive, so any contaminant hotspots are likely to be localised, and unable to freely migrate through the aquifers. Development of the site will facilitate remedial works, which would reduce the risk to controlled waters.

Source	Pathway	Receptor	Consequence	Probability	Risk	Potential Mitigation/Investigation Requirements
Pesticides and herbicides within fields and along railway lines;	Dermal contact with, and incidental ingestion or inhalation of soil and/or dust.	Future commercial site users	Mi	Ul	VL	Ground investigation should be undertaken to confirm the presence of pesticides and herbicides and assess the risk to flora and fauna. The Proposed Development is likely to have limited areas of soft landscaping, so a pathway to future site users is unlikely to be realised. If contaminants are encountered at the site as part of more detailed investigation works, the risk to future site users could be mitigated by the incorporation of clean capping layers in soft landscaped areas. The exposure of intrusive maintenance workers can be mitigated by the adoption of suitable working methods, utilising appropriate personal protective equipment (PPE) and maintaining good hygiene.
		Intrusive maintenance workers	Mi	Ul	VL	
		Flora and Fauna	Mi	Lw	L	
	Leaching and permeation through soil profile.	Underlying Secondary Aquifers	Md	Ul	L	Ground investigation should be undertaken to confirm the presence of pesticides and herbicides. The soils at the site are predominantly cohesive, so any contaminant hotspots are likely to be localised, and unable to freely migrate through the aquifers. Development of the site will facilitate remedial works, which would reduce the risk to controlled waters.
	Surface run-off.	Field drainage system and streams	Mi	Ul	VL	
	Lateral migration of contaminated groundwater and subsequent root uptake	Off site SSSI, Ancient Woodlands and Local Nature Reserves	Md	Ul	L	Ground investigation should be undertaken to confirm the presence of pesticides and herbicides. The soils at site are predominantly cohesive, so any contaminant hotspots are likely to be localised, and unable to freely migrate through the aquifers. Development of the site will facilitate remedial works, which would reduce the risk to controlled waters.
Organic rich Alluvium could represent a potential source of hazardous ground gasses.	Migration and accumulation of ground gases in enclosed spaces leading to asphyxiation (carbon dioxide) or explosion (methane).	Future commercial site users	Md	Ul	L	Preliminary ground investigation has identified low gas concentrations, with most of the site indicated to be CS1 whereby gas protection measures are not required. One isolated occurrence of elevated carbon dioxide was recorded. Further gas monitoring is required to determine whether gas protection measures are required.
Area 2 – Proposed A47 Link Road						

Source	Pathway	Receptor	Consequence	Probability	Risk	Potential Mitigation/Investigation Requirements
Made Ground at the site related to the realignment of water courses. could contain heavy metals, hydrocarbons and a potential source of hazardous ground gasses.	Dermal contact with, and incidental ingestion or inhalation of soil and/or dust.	Future commercial site users	Mi	Ul	VL	Ground investigation works have not been undertaken in Area 2, and there is potential for localised Made Ground. The Proposed Development will comprise an access road, so a pathway to future site users is unlikely to be realised. If contaminants are encountered at the site as part of more detailed investigation works, the risk to future site users could be mitigated by the incorporation of clean capping layers in soft landscaped areas. The exposure of intrusive maintenance workers can be mitigated by the adoption of suitable working methods, utilising appropriate personal protective equipment (PPE) and maintaining good hygiene.
		Intrusive maintenance workers	Mi	Ul	VL	
	Leaching and permeation through soil profile.	Underlying Secondary Aquifers	Md	Ul	L	Ground investigation works have not been undertaken in Area 2, and there is potential for localised Made Ground. However, a significant contaminant source has not been identified, The soils at site are predominantly cohesive, so any contaminant hotspots are likely to be localised, and unable to freely migrate through the aquifers. Development of the site will facilitate remedial works, which would reduce the risk to controlled waters.
	Vertical and lateral migration of contaminants.		Md	Ul	L	
	Lateral migration of contaminated groundwater.	Wider Secondary Aquifers	Md	Ul	L	
	Surface run-off.	Field drainage system and streams	Mi	Ul	VL	
	Lateral migration of contaminated groundwater and root uptake	Off site SSSI, Ancient Woodlands and Local Nature Reserves	Md	Ul	L	The woodlands represent a sensitive receptor. Ground investigation works have not been undertaken in Area 2, and there is potential for localised Made Ground. However, a significant contaminant source has not been identified, The soils at site are predominantly cohesive, so any contaminant hotspots are likely to be localised, and unable to freely migrate through the aquifers. Development of the site will facilitate remedial works, which would reduce the risk to controlled waters.
Asbestos within shallow soils	Inhalation of dust and/or fibres	Future commercial site users	Mi	Ul	VL	Asbestos containing materials on farm buildings should be removed from site by a competent asbestos removal contractor.

Source	Pathway	Receptor	Consequence	Probability	Risk	Potential Mitigation/Investigation Requirements
around farm buildings;		Intrusive maintenance workers	Mi	Ul	VL	The risk to future site users is minimal based on the proposed end use and predominantly hardstand nature of the development. The exposure of intrusive maintenance workers can be mitigated by the adoption of suitable working methods, utilising appropriate personal protective equipment (PPE) and maintaining good hygiene.
Pesticides and herbicides within fields and along railway lines;	Dermal contact with, and incidental ingestion or inhalation of soil and/or dust.	Future commercial site users	Mi	Ul	VL	Ground investigation should be undertaken to confirm the presence of pesticides and herbicides and assess the risk to flora and fauna. The Proposed Development is likely to have limited areas of soft landscaping, so a pathway to future site users is unlikely to be realised. If contaminants are encountered at the site as part of more detailed investigation works, the risk to future site users could be mitigated by the incorporation of clean capping layers in soft landscaped areas. The exposure of intrusive maintenance workers can be mitigated by the adoption of suitable working methods, utilising appropriate personal protective equipment (PPE) and maintaining good hygiene.
		Intrusive maintenance workers	Mi	Ul	VL	
		Flora and Fauna	Mi	Lw	L	
	Leaching and permeation through soil profile.	Underlying Secondary Aquifers	Md	Ul	L	Ground investigation should be undertaken to confirm the presence of pesticides and herbicides. The soils at site are predominantly cohesive, so any contaminant hotspots are likely to be localised, and unable to freely migrate through the aquifers. Development of the site will facilitate remedial works, which would reduce the risk to controlled waters.
	Surface run-off.	Field drainage system and streams	Mi	Ul	VL	
Area 3 - M69 Junction 2 Improvements						
Made Ground at the site but predominan	Dermal contact with, and incidental ingestion or	Future commercial site users	Mi	Ul	VL	Preliminary ground investigation works did not record elevated contaminant concentrations.

Source	Pathway	Receptor	Consequence	Probability	Risk	Potential Mitigation/Investigation Requirements
tly located around road networks - could contain heavy metals, hydrocarbons asbestos	inhalation of soil and/or dust.	Intrusive maintenance workers	Mi	Ul	VL	The proposed development will comprise an access road, so a pathway to future site users is unlikely to be realised. If contaminants are encountered at the site as part of more detailed investigation works, the risk to future site users could be mitigated by the incorporation of clean capping layers in soft landscaped areas. The exposure of intrusive maintenance workers can be mitigated by the adoption of suitable working methods, utilising appropriate personal protective equipment (PPE) and maintaining good hygiene.
	Leaching and permeation through soil profile.	Underlying Secondary Aquifers	Md	Ul	L	Preliminary ground investigation works have not identified a significant risk to controlled waters. The soils at site are predominantly cohesive, so any contaminant hotspots are likely to be localised, and unable to freely migrate through the aquifers. Development of the site will facilitate remedial works, which would reduce the risk to controlled waters.
	Vertical and lateral migration of contaminants.		Md	Ul	L	
	Lateral migration of contaminated groundwater.	Wider Secondary Aquifers	Md	Ul	L	
	Surface run-off.	Field drainage system and streams	Mi	Ul	VL	
	Lateral migration of contaminated groundwater and root uptake	Off site SSSI, Ancient Woodlands and Local Nature Reserves	Md	Ul	L	The woodlands represent a sensitive receptor. Ground investigation works have not been undertaken in Area 2, and there is potential for localised Made Ground. However, a significant contaminant source has not been identified, The soils at site are predominantly cohesive, so any contaminant hotspots are likely to be localised, and unable to freely migrate through the aquifers. Development of the site will facilitate remedial works, which would reduce the risk to controlled waters.
Eastern Village Bypass						
Made Ground at the site but predominan	Dermal contact with, and incidental ingestion or	Future commercial site users	Mi	Ul	VL	A significant contaminant source has not been identified. Furthermore, the Proposed Development will comprise a link road, so a

Source	Pathway	Receptor	Consequence	Probability	Risk	Potential Mitigation/Investigation Requirements
tly located in area of infilled clay pit, around farm buildings and roads could contain heavy metals, hydrocarbons, and/ or asbestos.	inhalation of soil and/or dust.	Intrusive maintenance workers	Mi	Ul	VL	pathway to future site users is unlikely to be realised. If contaminants are encountered at the site as part of ground investigation works, the risk to future site users could be mitigated by the incorporation of clean capping layers in soft landscaped areas. The exposure of intrusive maintenance workers can be mitigated by the adoption of suitable working methods, utilising appropriate personal protective equipment (PPE) and maintaining good hygiene.
	Leaching and permeation through soil profile.	Underlying Secondary Aquifers	Md	Ul	L	A significant contaminant source has not been identified, The soils at site are predominantly cohesive, so any contaminant hotspots are likely to be localised, and unable to freely migrate through the aquifers. Development of the site will facilitate remedial works, which would reduce the risk to controlled waters.
	Vertical and lateral migration of contaminants.		Md	Ul	L	
	Lateral migration of contaminated groundwater.	Wider Secondary Aquifers	Md	Ul	L	
	Surface run-off.	Field drainage system and streams	Mi	Ul	VL	
Possible Asbestos within shallow soils around farm buildings;	Inhalation of dust and/or fibres	Future commercial site users	Mi	Ul	VL	If present, Asbestos containing materials on farm buildings should be removed from site by a competent asbestos removal contractor. The risk to future site users is minimal based on the proposed end use and predominantly hardstand nature of the Proposed Development. The exposure of intrusive maintenance workers can be mitigated by the adoption of suitable working methods, utilising appropriate personal protective equipment (PPE) and maintaining good hygiene.
		Intrusive maintenance workers	Mi	Ul	VL	
Pesticides and herbicides within fields and in storage areas within	Dermal contact with, and incidental ingestion or inhalation of soil and/or dust.	Future commercial site users	Mi	Ul	VL	Ground investigation should be undertaken to confirm the presence of pesticides and herbicides and assess the risk to flora and fauna. The Proposed Development is likely to have limited areas of soft landscaping, so a pathway to future site users is unlikely to be realised. If contaminants are encountered at the site as part of ground investigation works, the risk to
		Intrusive maintenance workers	Mi	Ul	VL	

Source	Pathway	Receptor	Consequence	Probability	Risk	Potential Mitigation/Investigation Requirements
farm complex;		Flora and Fauna	Mi	Lw	L	future site users could be mitigated by the incorporation of clean capping layers in soft landscaped areas. The exposure of intrusive maintenance workers can be mitigated by the adoption of suitable working methods, utilising appropriate personal protective equipment (PPE) and maintaining good hygiene.
	Leaching and permeation through soil profile.	Underlying Secondary Aquifers	M d	Ul	L	Ground investigation should be undertaken to confirm the presence of pesticides and herbicides. The soils at site are predominantly cohesive, so any contaminant hotspots are likely to be localised, and unable to freely migrate through the aquifers. Development of the site will facilitate remedial works, which would reduce the risk to controlled waters.
	Surface run-off.	Field drainage system and streams	Mi	Ul	VL	
Soils in areas where waste treatment/ disposal/ storage activities have taken place could contain increased ash, organic material, heavy metals, and hydrocarbons.	Dermal contact with, and incidental ingestion or inhalation of soil and/or dust.	Future commercial site users	Mi	Ul	VL	The Proposed Development will comprise an access road, so a pathway to future site users is unlikely to be realised. If contaminants are encountered at the site as part of ground investigation works, the risk to future site users could be mitigated by the incorporation of clean capping layers in soft landscaped areas. The exposure of intrusive maintenance workers can be mitigated by the adoption of suitable working methods, utilising appropriate personal protective equipment (PPE) and maintaining good hygiene.
		Intrusive maintenance workers	Mi	Ul	VL	
	Leaching and permeation through soil profile.	Underlying Secondary Aquifers	M d	Ul	L	The waste exemptions are permitted low risk activities, and unlikely to be representing a significant risk to controlled water receptors. Furthermore, the soils at site are predominantly cohesive, so any contaminant hotspots are likely to be localised, and unable to freely migrate through the aquifers. Development of the site will facilitate remedial works, which would reduce the risk to controlled waters.
	Vertical and lateral migration of contaminants.		M d	Ul	L	
	Lateral migration of contaminated groundwater.	Wider Secondary Aquifers	M d	Ul	L	
	Surface run-off.	Field drainage system and streams	Mi	Ul	VL	
Off Site Sources						

Source	Pathway	Receptor	Consequence	Probability	Risk	Potential Mitigation/Investigation Requirements
Railway station and subsequentl y scrap yard - potential source of heavy metals, hydrocarbon s, volatile compounds and hazardous ground gasses.	Migration and accumulation of ground gases in enclosed spaces leading to asphyxiation (carbon dioxide) or explosion (methane).	Future commerci al site users	M d	Ul	L	Made Ground adjacent to the site could represent a localised potential source of ground gas which could migrate onto site. Further gas monitoring is required to determine whether gas protection measures are required.
	Lateral migration of contaminated groundwater.	Underlyin g Secondary Aquifers	M d	Ul	L	Preliminary ground investigation information did not identify significantly elevated contaminants within groundwater at the site. The cohesive soils should prevent contaminant migration towards the site and prevent degradation of the aquifer on site.
Landfill – potential for leachate migration towards site.	Lateral migration of contaminated groundwater/ leachate.	Underlyin g Secondary Aquifers	M d	Ul	L	Preliminary ground investigation information did not identify significantly elevated contaminants within groundwater at the site. The cohesive soils should prevent contaminant migration towards the site and prevent degradation of the aquifer on site.
Organic rich Alluvium could represent a potential source of hazardous ground gasses.	Migration and accumulation of ground gases in enclosed spaces leading to asphyxiation (carbon dioxide) or explosion (methane).	Future commerci al site users	M d	Ul	L	Alluvium adjacent to the site could represent a localised potential source of ground gas which could migrate onto site. Further gas monitoring is required to determine whether gas protection measures are required.
Electricity substation located 200m north represents potential source of oils and PCBs,	Lateral migration of contaminated groundwater.	Underlyin g Secondary Aquifers	Mi	Ul	VL	If the electricity substation dates to pre 1980s, it may represent a potential source of PCBs and oils. The cohesive soils should prevent contaminant migration towards the site, and prevent degradation of the aquifer on site, especially when considering the distance from site.

Source	Pathway	Receptor	Consequence	Probability	Risk	Potential Mitigation/Investigation Requirements
Made Ground associated with infilled clay pit adjacent to the site could contain heavy metals, hydrocarbons, and/ or asbestos.	Lateral migration of contaminated groundwater.	Underlying Secondary Aquifers	Md	Ul	L	The cohesive soils should prevent contaminant migration towards the site and prevent degradation of the aquifer on site.
VH = Very High, H = High, M = Moderate, M/L = Moderate/Low, L = Low, VL = Very Low KEY: Sv = Severe, Md = Medium, Mi = Mild, Mr = Minor, Hi = High, Li = Likely, Lw = Low Likelihood, Ul = Unlikely						

POTENTIAL SIGNIFICANT ENVIRONMENTAL EFFECTS OF THE PROPOSALS

Construction phase

16.98. Based on the assessment above there are no particular significant adverse effects identified across Areas 1 to 3. The following assessment therefore considers the Main Oder Limits Site as a whole with particular reference to the earthworks which are assumed will be completed as a site wide exercise.

16.99. The significant effects have been assessed assuming that the earthworks exercise will be completed at the Main Order Limits Site comprising a site strip to remove topsoil and a bulk earthworks cut and fill exercise to prepare development platform(s). We have estimated that the volume of cut will be 1.2 million cubic metres of material.. The principal of this scheme is to achieve a cut and fill balance to eliminate the generation of this waste. The earthworks will be designed to achieve a cut and fill balance, material quality will be assessed to ensure material is placed in a suitable location onsite, minimising the requirement to dispose of excavated material.

16.100. The topography of the Main HNRFI Site and A47 and M69 Links will require a cut and fill exercise to produce a development plateau. The majority of the cut will be generated from the south western end of the Main HNRFI Site redistributing material in the lower lying central area of the Main HNRFI Site. The more significant earthworks will be required around existing infrastructure, particularly the upgrades and links to Junction 2 of the M69 and around the railway where rail sidings and a new bridge and associated structures are to be constructed. Areas of cut and fill are shown on figure 15.3HRF-BWB-HGN-XX-DR-CH-0610 titled “Proposed Plateau levels Isopachytes”.

Risks to human health

16.101. Localised contamination may be expected around demolition of farm buildings, likely to comprise asbestos, petroleum hydrocarbons and agrochemicals (pesticides, herbicides, insecticides). The preliminary ground investigation has not identified any significant contamination sources at the Main HNRFI Site, and based on the current and historical land use there is a low risk of further significant contamination being identified during the groundworks.

16.102. There is a low risk of further contamination of soils from asbestos in existing buildings provided that the asbestos survey and removal is conducted in accordance with HSE guidance.

16.103. If unforeseen contamination is identified ground workers may be exposed through direct exposure, dermal contact and inhalation of dusts and particulates. Localised spillages of hydrocarbons could contaminate soils generate vapours which the potential to migrate into confined spaces within buildings.

16.104. The effect of contaminated soils on construction workers are considered to be of minor significance, confined to a localised area and of short duration.

Risks to controlled waters

16.105. Localised contamination may be mobilised during construction, where soils are excavated, and incident rainfall leaches soluble contaminants. In addition, earthworks in general have the potential to increase erosion and migration of particulate matter and suspended solids into water courses, running across the Main HNRFI Site. The works will be phased as set out in Chapter 3, with initial earthworks for the M69 J2 enhancement, and A47 link and road connected building completed in Stage 1 and the remaining earthworks in Stage 2. Based on the expected development timescales, development plots may be prepared but will remain undeveloped for a period of 3-5 years before development, therefore careful management of runoff and stockpiles will be required to prevent excessive suspended solids entering water courses. The effect on controlled waters during construction are considered to be of minor adverse significance, confined to a localised area and of short / medium duration.

16.106. The underlying strata are classified as Secondary A and B Aquifers Preliminary ground investigation works have not identified a significant risk to controlled waters. The soils at site are predominantly cohesive, so any contaminant hotspots are likely to be localised, and unable to freely migrate through the aquifers.

Risks to buildings and structures

16.107. The earthworks could require the cut and fill of approximately 1.2 million m^3 of soils and shallow rock across the Main Order Limits Site to create development platforms, railbed and roadways. Earthworks have the potential to cause local instability in particular around existing slopes and retaining structures associated with the rail mainline cutting and M69 embankment. The effect on buildings and structures during construction are considered

to be of minor adverse significance, confined to a localised area but could be permanent duration.

Other risks

16.108. The majority of the Main HNRFI Site is classified as Grade 3b poor quality agricultural land. The Proposed Development will result in the permanent loss of approximately 2.9Ha of Grade 3a good quality agricultural land which is considered a slight adverse effect of minor significance.

16.109. Generation of dust during earthworks has the potential to affect the woodland to the south. Although the majority of soils are uncontaminated dust itself may have a detrimental effect on the ecologically sensitive site to the south and west if not adequately controlled. These effects are considered in detail in the Chapter 9: *Air quality* and Chapter 12: *Ecology and biodiversity* of this PEIR.

Operational phase

Risks to human health

16.110. The Main HNRFI site will be predominantly hard cover and therefore there is a low risk of future site users being exposed to any soil or groundwater contamination. Low concentrations of ground gas have been recorded and are not expected to be at significant levels beneath the Main HNRFI Site. The effect on human health during operation is considered to be of negligible significance.

Risks to controlled waters

16.111. The presence of significant hardstanding will reduce the infiltration of rainfall and subsequent leaching of any soluble contamination in shallow soils into underlying groundwater (Secondary A and B Aquifers) and surface waters.

16.112. Runoff from goods vehicles using the Main HNRFI Site has the potential to be impacted by heavy metals and petroleum hydrocarbons.

16.113. Railway maintenance areas may involve storage of chemicals including fuels, lubricants and cleaning products. Temporary waste storage areas may be required. The effect on controlled waters during operation are considered to be of minor adverse significance, confined to a localised area and of short / medium duration.

Risks to buildings and structures

16.114. Due to the depth of earthworks, buildings may be constructed on a significant thickness of engineered fill. Poorly compacted or uncontrolled earthworks could cause significant settlements which could cause damage to buildings. The effect on buildings are considered to be of minor adverse significance, confined to a localised area and of short / medium duration.

PROPOSED MITIGATION

Construction phase

Risks to human health

16.115. Demolition of existing buildings must be completed in accordance with Control of Asbestos Regulations 2012. Prior to demolition a full asbestos survey must be completed to identify all asbestos and enable a plan of work to be prepared to safely remove any asbestos.

16.116. Any asbestos contaminated soils may be retained on site beneath hardstanding subject to a risk assessment and preparation or a safe system of work under the Control of Asbestos Regulations 2012.

Risks to controlled waters

16.117. Detailed investigation of the Main Order Limits Site will be completed to ensure that excavated materials are suitable for use and any areas of potential contamination fully characterised and remediation strategies prepared. The scale of the development will allow any required soil treatment such as bioremediation to be completed and soils retained for re-use. Any remediation would be completed under an Environmental Permit.

16.118. A CEMP will be prepared for the ES setting out the requirements for management of dusts, odours and other sources of nuisance. There will be a particular focus on management of run off and protection of water courses from suspended solids in runoff and prevention of erosion and dust generation. This may include construction of temporary settlement ponds, silt fences and seeding of temporary stockpiles.

16.119. Designated fuelling areas for plant will be set up with suitable double bunding for tanks, spill kits available and an emergency plan in place for dealing with any spills. Plant operators will receive appropriate training to avoid spills. The revoked EA Pollution Prevention Guidance provides useful recommendations of best practice for refuelling, including regular testing and maintenance of storage tanks.

16.120. All fuel tanks will be bunded with a capacity of 110% of the tank volume. Spill kits should be available at all fuelling locations and regular training provided on dealing with spillages. Drip trays should be used under vehicles where appropriate to ensure that oil is collected and contained to prevent infiltration of contaminated waters.

16.121. To avoid infiltration of polluted water from vehicles or accidental spillage, vehicles should be inspected regularly and maintained to reduce the risk of leakages. Vehicle wash-down areas should be at least 10m from any surface waters and located in a designated bunded impermeable area. Any runoff should be treated through oil interceptors prior to discharge.

Risks to buildings and structures

16.122. The design will incorporate significant earthworks to prepare platforms for development. Where feasible a cut and fill balance will be obtained to avoid importation or export of materials. Topsoil will be stripped and stockpiled with a volume retained for use in soft landscaping. Surplus of topsoil will require removal although where feasible this will be reused. An earthworks specification will be prepared setting out the methods by which materials will be handled and re-engineered and the verification requirements to demonstrate that works have been completed to an acceptable standard.

16.123. The timescales for the Proposed Development allow receiver sites to be found as the project progresses to avoid disposal of material to landfill. Re-use of soils materials would be facilitated under a Material Management Plan under the CL:AIRE Definition of Waste Code of Practice (DoWCoP)[14] prepared prior to development commencing.

16.124. The CL:AIRE Definition of Waste Code of Practice to demonstrate that excavated soils that are re-used meet the criteria for:

- protection of human health and protection of the environment;
- suitable for use without further treatment;
- quantity of use; and
- certainty of use.

16.125. To mitigate the risks associated with the generation of contaminated dusts during the remediation (potentially required) and earthworks being undertaken at the Study Area, exposed areas will be dampened down during the construction work in order to reduce the amount of dust generated. In addition, the levels of dust generated will be monitored throughout the works. This would be set out within the Construction Environmental Management Plan (CEMP) which will be submitted as part of the ES.

16.126. Works near to existing rail and road structures will be subject to detailed geotechnical design and assessment approval in accordance with Highways England Design Manual for Roads and Bridges, CD 622, Managing geotechnical risk in the case of the Highways Agency and to Network Rail Standards. Slopes will require detailed assessment and appropriate design, retaining and temporary shoring.

Operational phase

16.127. Further detailed investigation is required at the site to support design following DCO. If elevated ground gases are recorded, suitable gas protection measures may be incorporated into the building design. The requirement for ground gas protection measures will be assessed on a plot by plot basis. The measures may incorporate the floor slab, gas impermeable membrane and/or sub sab ventilation in accordance with current

[14] CL:AIRE The Definition of Waste: Development Industry Code of Practice Version 2 March 2011

best practice. Monitoring to date has identified some elevated Carbon dioxide typical of characteristic situation CS2 conditions. Further monitoring may be required after completion of earthworks to assess whether the gas regime has changed.

16.128. Fuel storage facilities required for the railport will be bunded with appropriate wet stock management and spill management systems. Refuelling areas will be constructed on impermeable cover.

Geotechnical constraints and opportunities

16.129. The Groundsure report, site history, current site setting and geology setting have all been considered in order to provide an indication of the potential ground related constraints and opportunities in the context of the Proposed Development as set out in Table 16.14.

Table 16.14: Ground related constraints and opportunities

Potential Constraint / Opportunity	Explanation	Potential Mitigation Options
Topsoil	The preliminary GI indicated that Topsoil is present across most of the site.	The third party report indicates that the topsoil does not meet the definition of Topsoil under BS3882:2015, and suitability for reuse would need to be informed by the landscape architect.
Preliminary Foundation Solution	It is likely that a significant earthworks operation will be required at the site to create development plateaus. Pad foundations are likely to be viable within engineered fill or natural deposits.	Ground investigation should be undertaken to confirm ground conditions at the site to inform detailed design. Made Ground, Alluvium and/or materials with high organic content to be relocated away from proposed building footprints.
Buried Obstructions	Limited buried obstructions are likely to be present across the site given the lack of development across the area.	Buried obstructions such as building foundations should be removed during the demolition works.
Shrink/Swell Clay	The Groundsure report indicates that the Alluvium and the outcropping Mercia Mudstone are typically low plasticity and represent a very low shrink/swell risk. The Glacial deposits across the rest of the site are indicated to have medium plasticity (low risk).	Plasticity of soils to be assessed as part of ground investigation. Foundations will need to consider potential for heave where located near to trees.
Running	The majority of soils across the	The risk associated with running sands

Potential Constraint / Opportunity	Explanation	Potential Mitigation Options
Sands	site are indicated to have a negligible or very low risk of running sands, however, the Alluvium is indicated to have a low risk of running sands.	should be considered during detailed design stage. To date, the Alluvium has been found as cohesive, and running sands are not likely to represent an issue.
Compressible Deposits	The Bosworth Clay and Alluvium are indicated to have a moderate compressibility risk, with the other strata indicated to have a negligible risk.	The risk associated with compressible deposits should be assessed during detailed design stage.
Collapsible Deposits	The site is indicated to have a very low/ negligible collapsible deposit risk.	N/A
Landslides	The site is indicated to have a very low risk of landslides, increased to low in a localised area around Junction 2 of the M69.	Slope stability assessments will be required to assess the potential for landslides to occur where slopes/cuttings form part of the Proposed Development plans.
Ground Dissolution of Soluble Rocks	Negligible risk recorded across the site.	N/A
Trees	Trees are present along field boundaries and watercourses, with woodland located immediately west of site.	Foundations in close proximity to new or existing trees may need to be locally deepened beyond the zone of influence of tree roots and/or heave precautions adopted.
Pyritic Geology	The Mercia Mudstone is indicated to be pyritic.	Preliminary investigation works indicated DS-1 AC1 conditions present at the site, increased to DS-2 AC2 where groundwater is encountered.
Retaining Walls	Retaining walls will be required as part of the Proposed Development	Retaining walls will need to be designed based on site specific data.
Drainage and Soakaways	Based on the cohesive nature of the majority of the soils across the site, infiltration-based drainage is unlikely to be viable.	Infiltration testing in accordance with current guidance would be required to inform the permeability of the soils to inform drainage design.
Roads and Pavements	California Bearing Ratio (CBR) values should be sought for road, car park and pavement design.	Preliminary third-party investigation suggest that a CBR of 3% is adopted for all soils excluding alluvium where <2.5% is recommended.
UXO	Review of the unexploded ordnance risk maps available	No further assessment required.

Potential Constraint / Opportunity	Explanation	Potential Mitigation Options
	online indicates the site to be in an area of low risk from UXO.	

RESIDUAL ENVIRONMENTAL EFFECTS

Construction phase

Physical effects

16.130. The earthworks will be designed to deliver a cut and fill balance to eliminate the need for offsite disposal of surplus soils or import of soils. The residual effect will be negligible due to negligible magnitude of effect of a low sensitivity resource.

16.131. The CEMP will set out the various measures to manage the effects from earthworks, which may include seeding of stockpiles, silt traps and temporary drainage grips. The residual effect will be negligible magnitude of effect of a low to medium sensitivity of controlled water receptors.

16.132. Stripped topsoil should be stored in separate resource bunds no more than 3m high and kept grassed and free from construction traffic until required for re-use. The Construction Code of Practice for Sustainable Use of Soils on Construction Sites (Defra, 2009) provides guidance on good practice in soil handling. The residual effect will be negligible due to negligible magnitude of effect of a medium sensitivity resource.

16.133. Detailed foundation design, and the associated methodology remains subject to intrusive ground investigations, to be undertaken at the appropriate time. If required, piling should be undertaken in accordance with best practice, as agreed with the relevant parties ahead of commencement of the works. The residual effect will be negligible due to negligible magnitude of effect of a low sensitivity resource.

Soil and groundwater quality

16.134. There will be an increased potential for direct human exposure to potential contamination identified in shallow soils through ingestion, direct contact or inhalation of contaminated soil or dust by construction workers in the short-term during construction works. To mitigate against such risks, construction workers and services personnel shall follow guidance stated in 'HSE 66 Protection of Workers and the General Public during Development of Contaminated Land' during construction works. Adequate standard personal protective equipment and the development of basic hygiene measures will be undertaken. The residual effect will be negligible.

16.135. Lubricants and refuelling facilities will be positioned away from the most sensitive receptors at the application site and operate in accordance with best practice. The

residual effect will be negligible due to negligible magnitude of effect of a medium sensitivity resource.

Operational phase

Soil and groundwater quality

16.136. The Main HNRFI site has remained largely undeveloped and there is a low risk of soil or groundwater contamination being present. Completion of ground investigation, and implementation of any required remediation strategy will remove any unacceptable risk to future site users. The residual effect will be negligible due to negligible magnitude of effect of a medium sensitivity resource.

16.137. There is a low risk of soil or groundwater contamination being present at the Main HNRFI Site and the Proposed Development will incorporate a predominantly hardstanding covering. This will minimise the infiltration of rainfall and recharge through the unsaturated zone thereby minimising potential contaminant mobility and reducing the risk to the underlying aquifer. The residual effect will be negligible due to negligible magnitude of effect of a medium sensitivity resource.

Ground gas

16.138. Completion of a further period of gas monitoring will be undertaken at the Main HNRFI site which will inform appropriate ground gas risk assessment and allow design of appropriate protection measures that need to be installed into new buildings in accordance with BS8485: 2015 +A1: 2019. Preliminary gas monitoring completed in 2018 indicated that parts of the Main HNRFI Site would be classified as CS2 and others CS1. Gas sources may be associated with pockets of contamination which may be removed as part of the earthworks phase. Monitoring may therefore be required prior to and on completion of earthworks to demonstrate removal of gas sources. The residual effect will be negligible due to negligible magnitude of effect of a medium sensitivity receptor.

CUMULATIVE AND IN-COMBINATION EFFECTS

16.139. The proposed and committed schemes listed within Appendix 20.1 have been reviewed and there are no current existing or permitted schemes that are relevant to, or would represent a cumulative impact with, the Proposed Development regarding Ground Conditions. Land contamination is subject to the same national guidance and all developments must meet a common standard for safe development with a requirement to undertake a phased investigation of the site including Phase 1 preliminary risk assessment, Phase 2 intrusive investigation remediation strategy, remediation implementation and verification. It is considered that there will be no significant cumulative effects on ground conditions and contamination resulting from the Proposed Development and the cumulative schemes considered as part of the assessment, as each development will incorporate appropriate mitigation measures to have overall negligible, or slight positive effects.

16.140. Consequently, it is considered that there are unlikely to be any cumulative effects on ground conditions. It is assumed that mitigation implemented for other committed developments will be undertaken to this standard, hence there should be no need for cumulative mitigation measures. Therefore, no cumulative effects are predicted with the relevant committed developments identified for consideration by this PEIR Chapter.

CLIMATE CHANGE

16.141. Consideration of the potential implications of future climate change has been incorporated into this assessment. Specifically, the mitigation measures have been designed to ensure the Proposed Development will remain safe for its lifetime. Careful control and monitoring of earthworks will ensure that the engineered soils are placed in accordance with the earthworks specification.

SUMMARY AND CONCLUSIONS

16.142. This chapter assesses the potential effects of the Proposed Development on Ground Conditions and Land Contamination. It describes the methods used to assess the effects, the baseline conditions currently existing at the application site and surroundings, the potential direct and indirect effects of the Proposed Development and the mitigation measures required to prevent, reduce or offset the potential effects and the residual effects.

16.143. The Chapter is supported by a Phase 1 Preliminary Risk Assessment for the Order Limits site (Appendix 15.1) and preliminary Ground Investigation for the Main HNRFI Site (Appendix 15.2) which are provided as technical appendices.

16.144. The Main HNRFI Site has predominantly remained undeveloped agricultural land with a number of farm buildings located on the Main HNRFI Site.

16.145. The Main HNRFI Site is indicated to be directly underlain by topsoil over drift deposits comprising glacial deposits of the Thrussington Member and Bosworth Clay Member. Localised deposits of Alluvium and the Wolston Sand & Gravel are mapped at the site. Bedrock is indicated to comprise the Mercia Mudstone. The site is predominantly classified as Grade 3b (poor quality) agricultural land, with approximately 2.9 hectares of Grade 3a land.

16.146. A cut and fill operation will be undertaken to create the development platform, with an approximate cut and fill balance to retain as much material as possible. Re-use of soils will be completed under an earthworks specification and a MMP in accordance with the DoWCoP to be prepared prior to the start of works.

16.147. Potential effects have been identified during construction associated with mobilisation of dusts and particulates, damage to excavated topsoil and from foundation works creating

pathways.

16.148. A CEMP will ensure that mobilisation of soils during the construction phase is minimised. The CEMP will outline detailed methodologies and monitoring requirements to prevent adverse effects on or from ground conditions.

16.149. No significant contamination of soils or groundwater is expected at the site. Sources of ground gas exist at shallow depth associated with alluvial soils and localised made ground around farm buildings.

16.150. Further intrusive ground investigation will be completed to support detailed design and confirm ground conditions, assess the presence of any soil or groundwater contamination and obtain information for foundation design. Ground gas monitoring will be undertaken, and a ground gas risk assessment completed to support the design of any required gas protection measures.

16.151. Nearby developments are subject to the same national guidance, with a requirement to deliver a safe development, including remediation of contamination where necessary, therefore, there are unlikely to be any significant cumulative effects requiring mitigation.

16.152. Overall, it is considered that potential effects from the construction and operational phases of the development will be negligible following the implementation of appropriate mitigation measures.

Tritax Symmetry (Hinckley) Limited

HINCKLEY NATIONAL RAIL FREIGHT INTERCHANGE

Preliminary Environmental Information Report

Chapter 17: Materials and waste

January 2022

This document forms a part of a Preliminary Environmental Information Report (PEIR) for the Hinckley National Rail Freight Interchange project.

A PEIR presents environmental information to assist consultees to form an informed view of the likely significant environmental effects of a proposed development and provide feedback.

This PEIR has been prepared by the project promoter, Tritax Symmetry (Hinckley) Limited. The Proposed Development is described in Chapter 3 of the PEIR and is the subject of a public consultation running from 12 January to 9 March 2022.

Details of how to respond to the public consultation are provided at the end of Chapter 1 of the PEIR and on the project website:

http://www.hinckleynrfi.co.uk/

This feedback will be taken into account by Tritax Symmetry (Hinckley) Limited in the preparation of its application for a Development Consent Order for the project.

Chapter 17 ◆ Materials and waste

INTRODUCTION

17.1. This Preliminary Environmental Information Report PEIR Chapter provides an assessment of potential impacts from the generation and management of waste and a consideration of material use. The current baseline conditions have been assessed and subsequently considered against the potential effects of the construction and operational phases of the Proposed Development. This assessment follows the guidance laid out in the IEMA Guide to Materials and Waste in Environmental Impact Assessment[1] (EIA). In accordance with guidance[2], the information presented is considered 'preliminary'; the PEIR submission forms an integral part of an iterative process for both the design of the Proposed Development and the EIA and will therefore take into consideration any comments received through this consultation.

17.2. An EIA Scoping Report was submitted for opinion by Tritax Symmetry (Hinckley) Limited ('TSH') in November 2020. This document concluded that the Proposed Development will result in a significant amount of construction and demolition waste being produced, hence an assessment of waste is required. This PEIR Chapter presents the results of the assessment of the potential environmental effects related to construction and operational waste arisings in terms of the likely quantities of waste arising, the proposed management of the waste onsite and the regional capacity to treat or dispose of residual waste. Operational waste is only of direct reference to the SRFI development containing buildings and the Railport (on the 'Main HNRFI Site'), and not to the highways related elements. Construction and Demolition waste relates to the whole of the Proposed Development including the Main HNRFI Site but also excludes the development of the highways improvement works.

17.3. The consideration of material resources comprises maximising the beneficial reuse of materials arising from the demolition of existing structures and construction of the Proposed Development (e.g. excavated material). Only if excavated material is not required or is unsuitable for the Proposed Development or specified receiver sites will it be transported offsite as waste.

17.4. In lieu of defined and detailed information with respect to end-user requirements, applied knowledge and assumptions have been applied qualitatively.

17.5. The principal objective of sustainable waste and material resource management is to use material resources more efficiently, thereby preventing and reducing the amount of waste generated as well as minimising the quantity of waste that requires final disposal to landfill. It is proposed that waste and materials will be dealt with in line with the

[1] IEMA, (2020): Materials and Waste in Environmental Impact Assessment.
[2] The Planning Inspectorate (May 2020): Advice Note Seven (Version 7); Environmental Impact Assessment: Process, Preliminary Environmental Information and Environmental Statements.

Government's waste hierarchy, which is a statutory requirement for sustainable waste and material resource management under regulation 15(1) of the Waste (England and Wales) Regulations 2011.

17.6. The waste hierarchy generally describes a priority order of what constitutes the best overall environmental option for the management of waste. It advocates the use of disposal only as a last resort, due to the range of potential adverse environmental effects associated with its use, such as loss of valuable land resources, greenhouse gas (GHG) emissions, and nuisance effects (e.g. dust and odour emissions).

17.7. The assessment of the suitability of soils excavated onsite for re-use onsite is outside the scope of this PEIR Chapter, the assessment of material quality is covered in Chapter 16: *Geology, soils and contaminated land*. Materials extracted and processed offsite are outside the scope of this assessment.

17.8. This assessment also only covers solid waste; the management of liquid waste such as wastewater from dewatering operations is covered in Chapter 15: *Hydrogeology*.

METHODOLOGY AND DATA SOURCES

Consultation

17.9. Local waste statistics were obtained from the Environment Agency (EA) to provide a forum for consultation with interested parties.

17.10. A public consultation was held between 8th July 2019 and 6th September 2019, however no responses were received relating to materials and waste.

The 2020 Scoping Opinion

17.11. An initial request for a scoping opinion was submitted to PINS in March 2018. A response from the Planning Inspectorate (on behalf of the Secretary of State) was received in April 2018.

17.12. An updated request for a scoping opinion covering amendments and updates since the project was reviewed in 2019, was submitted to PINS in November 2020. A Scoping Opinion document was received in December 2020 from the Planning Inspectorate, on behalf of the Secretary of State.

17.13. As set out in the EIA Scoping Opinion (dated December 2020), comments specific to materials and waste were returned. These are included in Table 17.2 for completeness. Each of the comments have been considered in the authoring of this PEIR Chapter and are included or qualified if excluded.

Table 17.1: Secretary of State's comments from EIA Scoping Opinion in relation to Waste and Materials (December 2020)

ID	Point	PINS Comments	Action Taken
4.11.1	Materials – consumption of resources	The Scoping Report states that the likely significant environmental effects from the use of materials for the construction of the Development will not be addressed in the ES as there is no fixed design to assess against or end-user to define requirements. The Inspectorate considers that whilst uncertainty exists surrounding the final design, an assessment of the nature and quantity of materials and natural resources would be feasible, to the extent that such information is available, applying knowledge of similar developments and the Rochdale envelope approach to uncertainty. The Inspectorate therefore does not agree to scope this matter out of the ES.	Considered: estimates of material consumption and waste generation during both construction and operation have been set-out using information available at the time of writing and following best practice guidance, please see paragraphs 17.69 to 17.96 for more details. These will be further supplemented in the ES.
4.11.2	Liquid waste	The Scoping Report states that liquid waste such as wastewater from dewatering operations is covered in Chapter (Surface Water and Flood Risk). Wastewater and dewatering operations are not mentioned in Chapter 13. This should be addressed in the ES.	Noted: dewatering is considered within Chapter 15 of this PEIR. Recommendations for the management of wastewater are set-out in Chapter 15.
4.11.3	Baseline	The description of baseline conditions in the Scoping Report provides no description of local or regional landfill capacity. The ES must consider the baseline and future baseline waste disposal capacity.	Considered: Tables 17.11, 17.12 and 17.13 identify local and regional waste treatment facilities and confirm current capacity.
4.11.4	Spatial Scope	The Scoping Report refers to the interchange site only. The ES must assess the impacts from the entirety of the Proposed Development. For clarity, and in line with the referenced IEMA (2020) guidance, the study area should be expressed in terms of (1) the 'development study area' comprising the scheme or project footprint (the red line	Considered: the Spatial Scope has been widened to account for both points 1 and 2 in paragraphs 17.16, 17.17 and 17.18.

ID	Point	PINS Comments	Action Taken
		boundary) and (2) the 'expansive study area' extending to the availability of construction materials, and capacity of waste management infrastructure (reflecting the anticipated extent of potential impacts).	
4.11.5	Approach and Assumptions	Application of published waste generation rates, and assumptions regarding the type and quantity of waste to be diverted from landfill via reuse, recycling and recovery should be clearly stated, referenced and justified in the ES. Agreement with consultees should be sought on the approach taken, and this should be evidenced in the ES	Considered: the chapter seeks to identity and define the baseline before quantifying the effects of the Proposed Development upon sensitive receptors. This PEIR report makes effort to agree the approach to the collection and presentation of information with relevant consultation bodies. The information presented is considered reasonable "*for the consultation bodies to develop an informed view of the likely significant environmental effects of the development (and of any associated development)*".
4.11.6	Magnitude of Impact	The Scoping Report does not provide a methodology for the assessment of the magnitude of impact from the generation and disposal of waste. The referenced IEMA (2020) guidance offers two methods (paragraph 10.3.2). The ES should clearly set out the approach taken.	Noted: Tables 17.12 to 17.18 and associated text define the approach to defining sensitivity of receptors, the magnitude of effect and the significance of effect in accordance with best practice guidance.

Guidelines

17.14. This assessment has been carried out in accordance with guidance laid out in the IEMA

Guide to Materials and Waste in EIA[3].

Study Area

17.15. The spatial scope of waste assessments is often not easily defined as issues associated with waste management can be far-reaching and extend beyond the DCO boundary.

17.16. For this assessment, the 'Development Study Area' in which operational waste arisings are likely to occur is defined by the SRFI development containing buildings and the Railport. The 'Development Study Area' in which construction and demolition waste arisings are likely to occur, is defined by the application boundary of the Main HNRFI Site (134.41 hectares or 1,344,100 m^2 as stated within the Illustrative Context Masterplan dated 31/10/2021). Operational, construction and demolition waste arisings exclude any waste generated as part of the highways improvement works in the wider DCO Site boundary as minimal construction and demolition waste is expected. Excavation waste arisings will include all anticipated excavations as a result of the Proposed Development.

17.17. The 'Expansive Study Area' is defined by the availability of landfill sites relative to the proximity of the 'Development Study Area' – this is based on a 30 kilometre (km) radius of the Main HNRFI Site and available waste collection facilities. This has to be realistic around the practicalities of construction and operation. If this process identifies a supply problem, then the Proposed Development will be forced to look at a wider catchment of landfill capacity. This comes with added challenges in that an increase in the Expansive Study Area will increase the catchment of other waste users/projects competing for capacity. This assessment looks at the available capacity and the quantities received to assess available capacity. The use of material received is an accurate record of the regional requirements when determining the baseline assessment. An increase of the Expansive Study Area will only be undertaken if the needs of the development cannot be met by local capacity. A smaller regional assessment is considered a more conservative approach than increasing the Expansive Study Area to outside the region.

17.18. A similar approach has been made for the assessment of available quarries for the supply of aggregates. The region is known to be rich in minerals and is a principal mineral producer nationally. As a result, the Study Area has been able to afford to remain relatively local in this assessment (20 km).

Establishing the baseline

17.19. Baseline data that is proportionate to the scale and nature of the Proposed Development has been collected. Regional baseline information was targeted as a priority.

17.20. Where applicable, production of excavated arisings, and generation and disposal of waste will be described and quantified for the existing activities and operations within the Development Study Area. A high-level assessment of the mineral resources and aggregates has been made.

[3] IEMA (2020) *IEMA Guide to: Materials and Waste in Environmental Impact Assessment.*

17.21. The assessment of the baseline will be proportionate to the Study Area receptors (landfill sites). This is measured by waste received by each receptor based on EA data.

Identifying the receptors

17.22. The IEMA Guide to Materials and Waste in EIA defines:

> *'For waste, the sensitive receptor is landfill capacity. Landfill is a finite resource, and hence – through the ongoing disposal of waste – there is a continued need to expand existing and develop new facilities. This requires the depletion of natural and other resources which, in turn, adversely impacts the environment.'*
>
> *'Materials are, in their own right, sensitive receptors. Consuming materials impacts upon their immediate and (in the case of primary materials) long-term availability; this results in the depletion of natural resources and adversely impacts the environment.'*

17.23. Receptors have been identified by a desk study of Ordnance Survey map data, publicly available data, the TSH EIA Scoping Report, the project Materials Management Plan (estimates of the cut and fill balance) and the use of waste management experience and judgement.

Sources of waste

17.24. The Proposed Development will generate the following types of waste during construction and will be considered in the assessment:

- excavation wastes;
- demolition wastes; and
- construction wastes.

17.25. Operationally, the completed scheme; used for logistics and distribution, is expected to generate waste. The assessment of potential waste output is undertaken using typical weekly waste arisings from British Standard BS 5906:2005[4].

Assessing sensitivity of a receptor

17.26. The significance of waste arisings is largely based on the nature of the waste, the location and capacity of local and regional waste management facilities and the sustainability of the disposal or processing method.

17.27. Overall, the purpose of a waste management assessment is to characterise development waste types and arisings and to identify existing and potential methods employed for their management, as well as the significance of change associated with a proposed development in comparison to the current and likely future situation without the development. For the purposes of this assessment, a methodology has been utilised that

[4] British Standard BS5906:2005 Waste management in buildings – Code of Practice.

allocates a 'score' based on various considerations of waste type and quantity, as well as disposal.

17.28. This approach broadly conforms with the standard EIA approach of assessing significance as a function of the magnitude of impact and sensitivity of any receptors. In this case, magnitude of impact and proximity and sustainability of receptors. The IEMA Guide to Materials and Waste in EIA divides the assessment of the sensitivity into the sensitivity of materials as a receptor and the sensitivity of landfill void capacity.

17.29. The sensitivity of materials can be determined by identifying where one or more of the criteria displayed in Table 17.2 are met.

Table 17.2: Assessment criteria for the sensitivity of material receptors

MATERIALS	
Negligible	Are forecast (through trend analysis and other information) to be free from known issues regarding supply and stock; and/or Are available comprising a very high proportion of sustainable features and benefits compared to industry-standard materials.
Low	Are forecast (through trend analysis and other information) to be generally free from known issues regarding supply and stock; and/or Are available comprising a high proportion of sustainable features and benefits compared to industry-standard materials.
Medium	Are forecast (through trend analysis and other information) to suffer from some potential issues regarding supply and stock; and/or Are available comprising some sustainable features and benefits compared to industry-standard materials
High	Are forecast (through trend analysis and other information) to suffer from known issues regarding supply and stock; and/or Comprise little or no sustainable features and benefits compared to industry-standard materials.
Very High	Are known to be insufficient in terms of production, supply and/or stock; and/or Comprise no sustainable features and benefits compared to industry-standard materials.

17.30. The sensitivity of landfill void capacity can be determined using Table 17.3 and Table 17.4.

Table 17.3: Inert and non-hazardous landfill void capacity sensitivity

WASTE	
Across construction and/or operation phases, the baseline/future baseline (i.e. without development of regional (or where justified, national) inert and non-hazardous landfill void capacity is expected to…	
Negligible	...remain unchanged or is expected to increase through a committed change in capacity.
Low	...reduce minimally: by <1% as a result of wastes forecast.
Medium	...reduce noticeably: by 1-5% as a result of wastes forecast.
High	...reduce considerably: by 6-10% as a result of wastes forecast.
Very High	... reduce very considerably (by >10%); end during construction or operation; is already known to be unavailable; or, would require new capacity or infrastructure to be put in place to meet forecast demand

Table 17.4: Hazardous landfill void capacity sensitivity

HAZARDOUS WASTE	
Across construction and/or operation phases, the baseline/future baseline (i.e. without development of regional (or where justified, national) hazardous landfill void capacity is expected to…	
Negligible	...remain unchanged, or is expected to increase through a committed change in capacity.
Low	...reduce minimally: by <0.1% as a result of wastes forecast.
Medium	...reduce noticeably: by 0.1-0.5% as a result of wastes forecast.
High	...reduce considerably: by 0.5-1% as a result of wastes forecast.
Very High	... reduce very considerably (by >1%); end during construction or operation; is already known to be unavailable; or, would require new capacity or infrastructure to be put in place to meet forecast demand.

17.31. The quantity of waste is assessed by interrogating the designs for the Proposed Development where possible, and by using professional judgement. An interpretation is then made as to whether it is likely to be hazardous.

Assessing magnitude of impact

17.32. The IEMA methodology[1] divides the assessment of magnitude of impact into the sensitivity of materials as a receptor and the sensitivity of landfill void capacity.

17.33. The magnitude of impact from materials can be determined using Table 17.5.

Table 17.5: Assessment criteria for the magnitude of impacts from materials

MATERIALS	
The assessment is made by determining whether, through a development, the consumption of:	
No change	…no material is required.
Negligible	...no individual material type is equal to or greater than 1% by volume of the regional baseline availability.
Minor	...one or more materials is between 1-5% by volume of the regional baseline availability; and/or the development has the potential to adversely and substantially impact access to one or more allocated mineral site (in their entirety), placing their future use at risk.
Moderate	...one or more materials is between 6-10% by volume of the regional baseline availability; and/or one allocated mineral site is substantially sterilised by the development rendering it inaccessible for future use.
Major	...one or more materials is >10% by volume of the regional baseline availability; and/or more than one allocated mineral site is substantially sterilised by the development rendering it inaccessible for future use.

17.34. The magnitude of impact from inert and non-hazardous waste can be determined using Table 17.6.

Table 17.6: Assessment criteria for the magnitude of impacts from inert and non-hazardous waste

WASTE	
No change	Zero waste generation and disposal from the development.
Negligible	Waste generated by the development will reduce regional landfill void capacity baseline by <1%.
Minor	Waste generated by the development will reduce regional landfill void capacity baseline by 1-5%.
Moderate	Waste generated by the development will reduce regional landfill void capacity baseline by 6-10%.
Major	Waste generated by the development will reduce regional landfill void capacity baseline by >10%.

17.35. The magnitude of impact from hazardous waste can be determined using Table 17.7.

Table 17.7: Assessment criteria for the magnitude of impacts from hazardous waste

HAZARDOUS WASTE	
No change	Zero waste generation and disposal from the development.
Negligible	Waste generated by the development will reduce national landfill void capacity baseline by <0.1%.
Minor	Waste generated by the development will reduce national landfill void capacity baseline by 0.1-0.5%.
Moderate	Waste generated by the development will reduce national landfill void capacity baseline by 0.5-1%.
Major	Waste generated by the development will reduce national landfill void capacity baseline by >1%.

Assessing significance of impact

17.36. The significance of impact can be determined using the sensitivity of receptor and the magnitude of impact to identify thresholds as shown in Table 17.8.

Table 17.8: Thresholds of impact

		Magnitude of impact				
Sensitivity of receptor		**No change**	**Negligible**	**Minor**	**Moderate**	**Major**
	Very High	Neutral	Slight	Moderate or large	Large or very large	Very large
	High	Neutral	Slight	Slight or moderate	Moderate or large	Large or very large
	Medium	Neutral	Neutral or slight	Slight	Moderate	Moderate or large
	Low	Neutral	Neutral or slight	Neutral or slight	Slight	Slight or moderate
	Negligible	Neutral	Neutral	Neutral or slight	Neutral or slight	Slight

17.37. Impacts which reach a threshold of moderate or above are considered significant. Where the threshold is "*slight or moderate*", professional judgement should be used in combination with documented justification, to determine a final outcome.

Assessing cumulative effects

17.38. The Study Area for the consideration of cumulative effects has been developed considering the predicted extent of impacts associated with waste regarding the Proposed Development, and with the point at which the associated effects become insufficient to

contribute in any meaningful way to those of another development.

17.39. A precautionary approach has been adopted in the definition of the Study Area to help to ensure that all potentially significant effects (including cumulative effects) have been effectively identified. Information on the likely extent of impacts associated with other developments in the area has also been considered. Where sufficient information exists, the Study Area includes all known proposed developments in the surrounding area that could potentially result in cumulative effects. Assessing the cumulative effects against operational waste can be undertaken by a review of development projects in the pipeline for the region, by a review of local development plans (stating future housing and other development requirements), and waste policy. Leicestershire County Council has recently produced a Minerals and Waste Local Plan which is referred to and used for assessing the operational cumulative effects in this chapter.

Identifying potential mitigation measures

17.40. Mitigation measures are identified using engineering judgement based on experience from previous projects.

Limitations and assumptions

17.41. The impacts associated with the bi-products and associated wastes from the extraction of raw materials and the manufacture of products outside of the Study Area are excluded from the scope. These stages of a product's or a material's life cycle will have been subjected to environmental assessment and are therefore outside the scope of this assessment.

17.42. There are a number of assumptions used in the preparation of this chapter in the absence of some design information and the end operational use. A summary of principal assumptions is summarised in Table 17.9 below.

Table 17.9: List of main assumptions

Assumption	
Floor footprint of units (including Railport)	650,000 m^2
External hardstanding	555,280 m^2
Earthworks cut and fill volume	1,200,000 m^3
Operational Recycling rates	65%[5]
Study area for landfill sites	30 km radius

17.43. For the assessment, the landfill capacity has been based on a projection of available capacity data from 2020 projected to 2025 based on the known material received in 2020.

[5] Waste Management Plan for England, January 2021 Department for Environment Rural & Food Affairs Available from: www.gov.uk/government/publications see p33 - Business Waste.

Although the bulk of the waste will be sent to landfill during the construction of the development, the construction period is likely to span a number of years and may not fall solely in one year. However, 2025 has been deemed as an appropriate approximation of the availability of capacity during the construction period.

RELEVANT LAW, POLICY AND GUIDANCE

Legislation

The Environmental Permitting (England and Wales) Regulations 2016[6]

17.44. The Environmental Permitting Regulations aim to ensure that waste activities are authorised and that their discharges do not harm human health or the environment. For the Proposed Development, environmental permits must be granted by the EA. The Regulations combine the requirements for an integrated waste management approach and for hazardous waste management. This provides a framework for regulation that enables the EA to assess permitting and compliance.

The Waste (England and Wales) Regulations 2011 (plus amendments)[7]

17.45. The Waste Regulations implement revisions to the Waste Framework Directive in England and Wales. They apply the waste hierarchy which details methods to reduce waste generation and the amount of waste sent to landfill. The methods of waste management in order of preference are:

- prevent;
- prepare for re-use;
- recycle;
- recover; and
- dispose.

The Hazardous Waste (England and Wales) Regulations 2005[8]

17.46. The Hazardous Waste Regulations set out the regime for the control and tracking of hazardous waste in England and Wales. The regulations introduced a process of registration of hazardous waste producers and a new system for recording the movement

[6] *The Environmental Permitting (England and Wales) Regulations 2016.* 675. London: The Stationery Office. Available from: https://www.legislation.gov.uk/ukdsi/2010/9780111491423/contents
[7] *The Waste (England and Wales) Regulations 2011*. 988. London: The Stationery Office. Available from: https://www.legislation.gov.uk/uksi/2011/988/contents/made
[8] *The Hazardous Waste (England and Wales) Regulations 2005.* 894. London: The Stationery Office. Available from: https://www.legislation.gov.uk/uksi/2005/894/made

of waste.

Policy

National Policy Statement for National Networks 2014[9]

17.47. This policy statement produced by the Department for Transport sets out the need for, and Government's policies to manage waste when delivering the development of nationally significant infrastructure projects (NSIPs) on the national road and rail networks in England.

17.48. The policy states that human health and the environment should be protected by producing less waste and by using it as a resource wherever possible. Where this is not possible, waste management regulation ensures that waste is disposed of in a way that is least damaging to the environment and to human health, i.e. by implementing sustainable waste management though the waste hierarchy (described in paragraph 17.54).

National Planning Policy Framework 2021[10]

17.49. The National Planning Policy Framework (NPPF) sets out the Government's planning policies for England. The NPPF must be taken into account in preparing development plans and is a material consideration in planning decisions. The policy sets out objectives for sustainable development which includes protecting and enhancing our natural, built and historic environment through minimising waste and pollution.

Our Waste, Our Resources: a Strategy for England 2018[11]

17.50. The Our Waste, Our Resources Strategy, building on the previous national waste strategies for 2000 and 2007, contains actions and commitments, which set a clear direction towards a zero-waste economy.

Leicestershire Minerals and Waste Local Plan up to 2031 (adopted 2019)[12]

17.51. This Minerals and Waste Local Plan includes the spatial vision, spatial strategy, strategic objectives, and core policies which to guide the future winning and working of minerals

[9] National Policy Statement for National Networks, Department for Transport, Available from https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/387222/npsnn-print.pdf

[10] Ministry of Housing, Communities & Local Government (2021) *National Planning Policy Framework.* London. Available from: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1005759/NPPF_July_2021.pdf

[11] HM Government (2018) *Our Waste, Our Resources: a Strategy for England.* London. Available from: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/765914/resources-waste-strategy-dec-2018.pdf

[12] Leicestershire County Council (2019) *Leicestershire Minerals and Waste Local Plan.* Leicestershire. Available from: https://www.leicestershire.gov.uk/sites/default/files/field/pdf/2019/10/3/Leicestershire-Minerals-and-Waste-Local-Plan-Up-to-2031-Adopted-2019.pdf

within Leicestershire. These also guide the waste management development within the County.

Mineral and Waste Safeguarding Hinckley and Bosworth 2015[13]

17.52. The Mineral and Waste Safeguarding guidance document produced by Leicestershire County Council identifies the areas within Hinckley and Bosworth District for mineral safeguarding. It also identifies the location of waste sites within the district for safeguarding.

Mineral and Waste Safeguarding Blaby District 2015[14]

17.53. The Mineral and Waste Safeguarding guidance document produced by Leicestershire County Council identifies the areas within Blaby District for mineral safeguarding. It also identifies the location of waste sites within the district for safeguarding.

Waste Management Hierarchy

17.54. The waste management principles of the waste hierarchy are now fully incorporated in the Waste Management Plan for England as objectives to be delivered through waste local plans. The requirement for a Best Practicable Environmental Option (BPEO) appraisal has been replaced in PPS 10 with a requirement for Strategic Environmental Assessment (SEA)/ Sustainability Appraisal (SA) to be undertaken for planning strategies and for it to be demonstrated that planned facilities represent the Best Available Technology (BAT).

Table 17.10: Principles of waste management - definitions.

Principle	Description
Waste Hierarchy	A theoretical framework used as a guide to the waste management options that should be considered when assessing the BPEO
Waste as a Resource	Certain wastes can be directly used or separated / processed for use as a replacement for raw materials, saving resources and potentially reducing energy use or other impacts associated with virgin resource extraction and transport.
Proximity Principle	Certain wastes can be directly used or separated / processed for use as a replacement for raw materials, saving resources and potentially reducing energy use or other impacts associated with virgin resource extraction and transport.
Regional Self-sufficiency	Where practical, waste should be treated or disposed of within the region in which it is produced.

[13] Leicestershire County Council (2015) *Mineral and Waste Safeguarding: Hinckley and Bosworth Borough.* Leicestershire. Available from: https://www.leicestershire.gov.uk/sites/default/files/field/pdf/2016/10/4/hinckley___bosworth_borough_s4_2015.pdf

[14] Leicestershire County Council (2015) *Mineral and Waste Safeguarding: Blaby.* Leicestershire. Available from: https://www.leicestershire.gov.uk/sites/default/files/field/pdf/2019/10/3/SUB2-Blaby-Safeguarding-2015.pdf

Principle	Description
Best Practicable Environmental Option (BPEO)	Defined by the Royal Commission on Environmental Pollution (1988) as the outcome of a systematic and consultative decision making procedure which emphasises the protection and conservation of the environment across land, air and water". The BPEO procedure establishes, for a given set of objectives, the option that provides the most benefits, as a whole, at acceptable cost, in both the short term and the long term. SA is designed to ensure compliance with SEA and as such includes for requirements on environmental decision making such as an opportunity for the public to express their opinion on draft plans (community involvement), take into account significant environmental effects including those on human health, material assets and climatic factors and a full assessment of alternative options and reasons why alternatives have been assessed and why others have not.

BASELINE CONDITIONS

Current baseline

17.55. At present the Main HNRFI Site comprises a mixture of farmland small holding and private dwellings. There is existing infrastructure in the immediate vicinity, the M69 motorway, including the roundabout infrastructure of junction 2, and the Leicester to Hinckley railway line along the north western boundary.

17.56. The Main HNRFI Site is a source of agricultural and green waste and potentially small quantities of commercial waste from Hobbs Hayes Farm and Woodhouse Farm. The exact quantities generated from the Main HNRFI Site are unknown but any waste from the agricultural activities that is sent off site for processing is considered to be negligible.

Ground conditions

17.57. A geological baseline and assessment is presented in Chapter 16 but a summary of ground conditions is as follows:

17.58. 1:50,000 British Geological Survey mapping shows surface geology to variously consist of some Alluvium, overlying Glacial Till (including Bosworth Clay, Thrussington Member and Wolston Sand and Gravel), underlain by Mercia Mudstone beneath the entire site. In local areas there are no superficial deposits. Such variation would be expected to significantly affect soil types and land quality.

17.59. The majority of the agricultural land is expected to remain undisturbed beyond standard farming practices. However disturbed ground is expected around the existing road and rail infrastructure. Potential sources of contamination arising from agricultural activities are also assessed in Chapter 16.

Receptor - Mineral resources

17.60. None of the Main HNRFI Site falls within a Coal Authority reporting area. Desk based studies do refence sand and gravel within the superficial deposits, further information is available in Chapter 16.

17.61. A number of quarries have been identified in the surrounding area to provide mineral sources. These are summarised in Table 17.11 below. There is no publicly available data on the capacity of the quarries that serve this area. A review of available aerial photography indicates that these are well established and of a significant size. On the basis of evidence of a number of available quarries but in the absence of any supporting capacity data, the sensitivity of the aggregate supply has been conservatively assessed as medium.

17.62. Information in the Leicestershire Minerals and Waste Local Plan supports this, confirming that the region is rich in mineral resources and meets the supply requirement for Leicestershire until 2031. The plan confirms a significant surplus of crushed rock from existing capacity in the Study Area. For sand and gravel there is resource but there is a requirement for extensions to existing permits.

Table 17.11: Regional quarries identified within a 20 km radius of the Main HNRFI Site.

Quarry Name	Operator	Address	Distance from Site
Croft Quarry	Aggregate Industries	Marion's Way, Leicester, LE9 3GP	7 km
High Cross Quarry	KSD Aggregates	High Cross Road, Claybrooke Magna, Lutterworth, LE17 5AU	10 km
Griff Quarry	MQP Griff Quarry	Gipsy Lane, Nuneaton, CV10 7PH	16 km
Hartshill Quarry	Crown Aggregates	Haartshill Quarry, Nuneaton Road, Nuneaton, CV10 0RT	18 km
Mansetter Winstone Quarry	Tarmac Mancetter quarry	Quarry Lane, Atherstone, CV9 2RF	19.5 km

Receptor - Existing facilities for the deposition of waste

17.63. A summary of the capacity and annual waste received data from active landfill sites within 30 km of the Main HNRFI Site has been summarised in Table 17.12 below. This data has been collated from '2020 remaining landfill capacity data'[15] along with the '2020 waste

[15] Environment Agency 2020 remaining landfill capacity data:

data interrogator data'[16] both from the environment.gov.uk website.

17.64. The extent of the regional baseline for landfill void capacity was determined to include three landfill sites that are accepting waste: Griff No4 Quarry Landfill, Cotesbach Landfill, and Ling Hall Landfill.

Table 17.12: Regional Landfill sites identified within 30 km of the Main HNRFI Site

Facility Name	Facility Address	Local Authority	Site Type	Total tonnes Received 2020	Remaining Capacity end 2020 (cubic metres)
Barrow Hill Quarry	Barrow Hill Quarry, Mill Lane, Earl Shilton, Leicestershire, LE9 7AW	Hinckley and Bosworth	L05 - Inert Landfill	Not found	52,000
Judkins Landfill Phase 3 (13 km)	Tuttle Hill, Nuneaton CV10 0JQ	Nuneaton and Bedworth	L04 - Non Hazardous	6,628	1,991,911
Griff No4 Quarry Landfill (18 km)	Griff Quarry, Gipsy Lane, Nuneaton, Warks, CV10 7PH	Nuneaton and Bedworth	L05 - Inert Landfill	628,795	2,958,916
Cotesbach Landfill (19.5 km)	Cotesbach Landfill, Gibbet Lane, Shawell, Lutterworth LE17 6AA	Harborough	L02 - Non Hazardous Landfill With Stabilised Non-Reactive Hazardous Wast (SNRHW) cell	342,436	9,708,837
Ling Hall Landfill (27.5 km)	Coalpit Lane, Lawford Heath CV23 9HH	Rugby	L02 - Non Hazardous Landfill With SNRHW cell	396,254	3,439,381

https://environment.data.gov.uk/portalstg/home/item.html?id=dc5ca7a937d34844b7e37e8bb8e6a360

[16] Environment Agency Waste Data Interrogator 2020: https://environment.data.gov.uk/portalstg/home/item.html?id=f11654b533574f4cbedd4f15b2691f5f

Facility Name	Facility Address	Local Authority	Site Type	Total tonnes Received 2020	Remaining Capacity end 2020 (cubic metres)
Kingsbury Landfill (29 km)	Rush Lane, Tamworth B77 1LT	North Warwickshire	L04 - Non Hazardous	Not found	3,460,000

Source: EA Waste Data Interrogator 2020[17] and EA Remaining Landfill Capacity 2020[18]

17.65. By assessing the cumulative landfill void capacity of Judkins, Griff No4 Quarry, Cotesbach and Ling Hall Landfill sites in Table 17.12, the calculation in Figure 17.1 below determines that the regional landfill void capacity forecasted for 2025 is 14.2 Million tonnes based on a projection of the quantity of material received in 2020 over a 5 year period against the 2020 capacity. At this same rate of receiving material (1.4 Million tonnes per year), based on the assessment criteria presented in the Table 17.3 in the methodology section, the sensitivity is assessed as very high.

Figure 17.1: Regional non hazardous / inert landfill capacity and received waste

Total Capacity of 5 sites 2020	= 18.1M m^3
At 1.2 tonnes per m3	= 21.7M tonnes
Total material received 2020	= 1.4M tonnes
2020 sensitivity	= 1.4/21.7 x 100% = 6.5% (High)
Projection of 5 years based on 1.4M tonnes per year	
5 year tonnage	= 7M tonnes
2025 Total Capacity	= 14.7M tonnes
2025 Sensitivity	= 1.4/14.7 x 100% = 9.5% (High)

17.66. Based on the EA Waste Data Interrogator 2020, there are nationally a limited number of hazardous waste landfill sites. The management and disposal of hazardous waste is a

[17] Environment Agency Waste Data Interrogator 2020: https://environment.data.gov.uk/portalstg/home/item.html?id=f11654b533574f4cbedd4f15b2691f5f

[18] Environment Agency Remaining Landfill Capacity 2020: https://environment.data.gov.uk/portalstg/home/item.html?id=dc5ca7a937d34844b7e37e8bb8e6a360

specialist process and usually will involve some interim treatment processes prior to disposal at landfill. The nearest hazardous waste landfill site is the East Northants Resource Management Facility located near Peterborough which is approximately 71 km from Hinckley. The calculation in Figure 17.2 below calculates the void capacity for Hazardous waste sites for 2020 and forecasted for 2025 both at a Regional and National level. In all cases the sensitivity is very high.

Figure 17.2: Regional and National Hazardous Waste Landfill capacity and received waste

	Regional	**Nationally**
Capacity in 2020 (volume) Capacity in 2020 (tonnage) At 1.2[19] tonnes per m^3	= 0.5M m^3 = 0.6M tonnes	= 16.4M m^3 = 19.7M tonnes
Material received 2020 2020 sensitivity	0.1M tonnes 0.1/0.5 x 100% = 20% (Very High)	0.85M tonnes 0.85/19.7 x 100% = 4.3% (Very High)
Projection of material received in 5 Year period (tonnage) 2025 Capacity based on 5 year projection 2025 sensitivity	= 0.5M tonnes = 0.1M tonnes Insufficient capacity – very high	= 4.25M tonnes = 15.45M tonnes 0.85/15.45 x 100% = 5.5% (Very High)

17.67. Asbestos is considered a hazardous waste. Asbestos waste is however accepted at non hazardous landfill sites with SNRHW Cells (Stable Non-Reactive Hazardous Waste). Two sites in Table 17.12, Cotesbach Landfill and Ling Hall Landfill both have SNRHW cells and accept asbestos. Cotesbach Landfill has the greater capacity, however due to the higher sensitivity for hazardous waste receptors, the cumulative hazardous landfill void capacity

[19] Using WRAP Waste Density Conversion Factor

sensitivity for these two sites is very high.

Figure 17.3: Regional Landfill capacity of sites with SNRHW cells and received waste

Total Capacity of 2 sites 2020 (volume)	= 13.1M m^3
Capacity in 2020 (tonnage) At 1.2 tonnes per m3	= 15.7M tonnes
Total material received 2020 (tonnes)	= 0.74M tonnes
2020 sensitivity high)	= 0.74/15.7 x 100% = 4.7% (Very
Projection of 5 years based on 0.74M tonnes per year	
Projected 5 year tonnage	= 3.7M tonnes
2025 forecasted Capacity	= 12M tonnes
2025 Sensitivity (Very high)	= 0.74/12 x 100% = 6.2%

Waste Material and Management Facilities

17.68. A review of waste management facilities located in Blaby, and Hinckley and Bosworth was conducted using the EA Waste Data Interrogator 2020[20]. The sites presented in Table 17.13 accepted Construction & Demolition waste at quantities of over 1,000 tonnes in that year.

Table 17.13: Facilities which accepted over 1,000 tonnes of Construction and Demolition waste in 2020

Site Name	Facility Type	Facility District	Tonnes Received
1st Choice Waste Yard	Non-Haz Waste Transfer / Treatment	Blaby	19,445
Aggregate Industries U K Limited	Physical Treatment	Blaby	4,040
Cliffe Hill Quarry	Physical Treatment	Hinckley and Bosworth	29,599

[20] Environment Agency Waste Data Interrogator 2020: https://environment.data.gov.uk/portalstg/home/item.html?id=f11654b533574f4cbedd4f15b2691f5f

Enva Whetstone Recycling And Resource Facility	Non-Haz Waste Transfer / Treatment	Blaby	20,409
Granite Close South	Non-Haz Waste Transfer / Treatment	Blaby	1,401
Granite Close Treatment And Transfer Facility	Non-Haz Waste Transfer / Treatment	Blaby	29,929
L C C Operational Highways - Croft Depot	Physical Treatment	Blaby	1,657
Lynden Lea	Non-Haz Waste Transfer	Hinckley and Bosworth	7,439
M A C Skip Hire Limited	Non-Haz Waste Transfer / Treatment	Hinckley and Bosworth	19,361
Wiggs Farm	Physical Treatment	Hinckley and Bosworth	2,793

17.69. There are ten waste transfer or treatment sites accepting more than 1,000 tonnes of construction and demolition waste respectively in 2020. These are sorting and recycling waste streams reducing the quantity going to landfill. The sensitivity of this receptor is considered to be low.

POTENTIAL SIGNIFICANT ENVIRONMENTAL EFFECTS OF THE PROPOSALS

Construction phase

17.70. This assessment has been separated to identify the impacts of solid waste that will be generated by demolition, earthworks, and construction activities that require off-site disposal during the construction period.

Demolition waste

17.71. Demolition works will be required as part of the Main HNRFI Site preparation works. This will include the demolition of highways infrastructure, hardstanding areas and buildings comprising farm buildings, residential dwellings, stables and other buildings. This will include a mixture of inert, non-inert and hazardous waste compounds.

17.72. Demolition of the buildings on the Main HNRFI Site will produce a variety of waste materials including concrete, masonry, aggregates, ferrous and non-ferrous material, timber, glass, plasterboard and slate. A relatively small quantity of material is expected to be generated from these demolition works. Using the Waste & Resources Action Programme ('WRAP') Designing out Waste Tool for Buildings[21] and based on the footprint area of existing buildings it has been calculated that demolishing the buildings within the Main HNRFI Site will result in approximately 20,424 tonnes of demolition waste, shown in Table 17.14. However, waste from steel frame buildings is expected to be less than the

[21] WRAP Designing out Waste Tool for Buildings: http://dowtb.wrap.org.uk/

shown calculated values as the buildings in this category are all agricultural barns with a lighter construction than the typical steel frame building.

Table 17.14: Building Demolition Waste, source: WRAP Designing out Waste Tool for Buildings

Building type	Total Building Demolition Volume (m^3)	Total Building Demolition Material (tonnes)
Masonry buildings (Housing)	8,946	4,866
Steel Frame buildings (barns)	33,106	15,558
Total	42,053	20,424

17.73. Existing roads will be demolished generating additional material, these have not been quantified, instead being included in the quantities for earthworks. Material generated will likely include crushed concrete, aggregate road base and road planings.

17.74. A high proportion of this demolition and site clearance material is expected to be suitable for reuse and recycling on site. This includes: reinforcement and structural steel work; masonry and brickwork; reinforced concrete and concrete; aggregate sub base; and bituminous pavement material. Where necessary these materials would be suitably processed, either onsite or offsite, to meet specification requirements.

17.75. The volumes of non-hazardous waste from demolition works are considered to be relatively low in comparison to the regional capacity. It is expected that a high proportion of the material generated will be recyclable and not go to landfill. The magnitude of the Non Hazardous / inert waste is considered to be negligible.

17.76. It is likely that the demolition will generate some asbestos hazardous waste. Asbestos will need to be surveyed prior to the commencement of demolition works so that all asbestos material can be separated and managed appropriately. The quantities are expected to be very low in comparison to the national capacity. The magnitude of the hazardous waste is considered to be negligible.

Earthworks

17.77. The topography of the Main HNRFI Site will require a cut and fill exercise to produce a development plateau. The majority of the cut will be generated from the south western end of the Main HNRFI Site redistributing material in the lower lying central area of the Main HNFRI Site and to the north west of the Main HNRFI Site. The more significant earthworks will be required around existing infrastructure, particularly the upgrades and links to Junction 2 of the M69 and around the railway where rail sidings and a new bridge and associated structures are to be constructed. Areas of cut and fill are shown on Figure 17.1.

17.78. The majority of excavated material is expected to be reused onsite e.g. a cut and fill

balance is intended. For the purpose of this assessment, only if excavated material is not required or is unsuitable for the development or specified receiver sites will it become waste.

17.79. Further details on the ground conditions are included in Chapter 16: *Geology, soils and contaminated land*. This includes an assessment of the materials suitability for reuse of soils and aggregates.

17.80. Engineering specifications and a Material Management Plan (MMP) will outline the suitability of material for re-use onsite and offsite in respect to structural and contamination status. It is anticipated that an Outline MMP will be secured by the DCO and be updated with additional detail post-consent.

17.81. The volume of cut has been estimated at 1.2 million cubic metres of material. In the event that this all goes to landfill then this would equate to a high impact based on the regional landfill void capacity. The principal of this scheme is to achieve a cut and fill balance to eliminate the generation of this waste. The earthworks will be designed to achieve a cut and fill balance, material quality will be assessed to ensure material is placed in a suitable location onsite, minimising the requirement to dispose of excavated material. With offsite disposal volumes expected to be minimal, the magnitude of impact for earthwork material being disposed of to landfill as non-hazardous or inert waste is assessed as negligible, being less than 1% of the regional capacity.

17.82. There are no known contamination sources that would cause the ground to be impacted to levels that could classify soils as hazardous waste and therefore the magnitude of impact from hazardous waste from the earthworks is no change.

Construction waste

17.83. Waste produced from the construction of buildings (including the Railport) within the Proposed Development is displayed in Table 17.15. This figure has been calculated using Smart Waste BRE Waste Benchmark Data[22] and assumes the buildings to be constructed are industrial buildings, producing an average quantity of 12.6 tonnes of construction waste per 100 m^2. This data provides an estimate of waste produced during the construction phase only and does not include demolition, excavation, or groundworks waste.

Table 17.15: Waste produced during construction of buildings within the Proposed Development, Source: BRE Waste Benchmark Data

Total Floorspace of New Buildings (m^2)	Total Building Construction Waste (tonnes)
650,000 m^2	81,900 tonnes

[22] Smart Waste BRE Waste Benchmark Data (2012)

17.84. Waste produced from the construction of roads and paved areas within the Main HNRFI Site (including hardstanding for the Railport) has been calculated based on a calculation of 3% of the materials and is displayed in Table 17.16 below.

Table 17.16: Waste produced during construction of roads and paved areas within the Proposed Development

Area of roads and car parks (m^2)	Volume of material, (assuming surface and road base thickness of 0.5m)	Estimated construction waste tonnes (3%)
555,280 m^2	277,640 m^3	9,995 tonnes

17.85. The magnitude of impact from the total quantity of construction waste is considered to be negligible.

Construction materials

17.86. Aside from the earthwork operations the Proposed Development would require the use of a range of other construction materials. These include: road paving, concrete, precast concrete, steel, plastics and timber.

17.87. The exact source of materials required for the construction of the Proposed Development cannot be defined at this stage. However, materials for construction would be sourced locally where practicable by the contractor.

17.88. Although the source of concrete and road surface cannot be defined at the moment a significant quantity of minerals are expected to be required for use as a sub-base, production of concrete, and road surfaces. For the benefit of this study some broad estimates have been made based on an allowance of an average of 0.8m thickness of aggregate in all forms of engineering fill, aggregate component of concrete and road paving. Concrete will be used for slabs within buildings and also for foundations. The built footprint comprises circa 650,000m^2 and the cumulative area of each of the plots is 1,340,000m^2. The estimate volume of mineral extraction is assumed to be 1,072,000m^3.

17.89. A review of the available quarries has been undertaken and five quarries have been identified in close proximity to the Main HNRFI Site and is summarised in Table 17.11. All five are within 20 km of the Main HNRFI Site. Mineral capacity data is not readily available as it is commercially sensitive information to operators and therefore not forthcoming. It is considered that given the number of quarries in close proximity to the Main HNRFI Site that there is a substantial quantity of quarried material available to this Site. In addition, this Site does benefit from the railway line and there will be the option to import

aggregates to the Main HNRFI Site by rail once the rail head has been constructed. On this basis the magnitude of impacts for materials for aggregate extraction is minor.

Storage of materials and waste

17.90. Measures to control the management and temporary storage of materials and waste during construction will be detailed within a Construction Environmental Management Plan (CEMP) and are therefore not covered in this assessment.

17.91. It is anticipated that waste will be separated at source where practical, with storage areas laid out to facilitate the segregation of waste material to encourage reuse and recycling; for example, by using colour coded skips. Signage should be used to clearly identify the material to be stored in each area and the site set up should be continuously reviewed and modified where necessary to maximise the opportunity for reuse and recycling.

17.92. It is expected that temporary storage areas will be provided with the capacity to store excavated material required for reuse onsite. Best practice guidance recommends that topsoil should not be stored at heights greater than 3m[23].

Transportation of waste

17.93. The movement of waste will be undertaken by road. The extent of the impacts will be proportional to the waste generated and any reduction in waste will reduce the impacts on the road network. During construction works the reuse of material onsite will reduce waste movements. The impact on air quality, noise, and traffic is assessed elsewhere in this PEIR. Any betterment in the reduction of waste generated will automatically reduce the transportation impact.

Construction impacts

17.94. An assessment of construction impacts in terms of materials use and waste is presented in Table 17.18.

Table 17.17: Assessment of the construction impacts

Project Activity	Activities with Potential impacts on material resource / waste	Sensitivity of Receptor	Description of Magnitude	Significance
Demolition	Disposal of demolition waste	High	Negligible	Slight

[23] Defra, 2009. Construction Code of Practice for the Sustainable Use of Soils on Construction Sites. Available online at: Construction Code of Practice for the Sustainable Use of Soils on Construction Sites (publishing.service.gov.uk)

Project Activity	Activities with Potential impacts on material resource / waste	Sensitivity of Receptor	Description of Magnitude	Significance
Demolition	Disposal of asbestos from demolition works	Very High	Negligible	Slight
Site preparation earthworks	Excavation and filling using site won materials, disposal of unsuitable material	Very High	Negligible	Slight
Construction	Use of quarried aggregate for construction (Concrete, sub base, road surfacing)	Medium	Minor	Slight
Construction	Construction waste	Low	Negligible	Neutral

Operation phase

17.95. An assessment of the likely waste impact is based on the typical weekly waste arisings quantities from BS5906:2005. The British Standard has typical quantities for a wide range of building types, this proposed use best fits with the industrial weekly arising of five litres per m^2 of floor area. Based on the assumed floor total area of 650,000 m^2, This equates to approximately 3,230m^3 of waste generated per week, or an annual waste arisings of 168,007m^3 / 35,281 tonnes per annum of waste generated (using the WRAP conversion of 0.21 tonnes per m^3 for municipal waste). It is anticipated that 35,281tpa (tonnes per annum) is above the expected figure for the proposed logistics park. On the assumption that the recycling rates will be 65%[24] this amounts to less than 1% of the annual landfill capacity for the Study Area. The magnitude of the operational waste is therefore assessed as negligible.

17.96. The railport is not expected to generate waste through its operation or maintenance. The replacement of rails on sidings will occur at a frequency greater than 50 years and it is assumed rails are recycled and ballast is cleaned and reused.

[24] Waste Management Plan for England, January 2021 Department for Environment Rural & Food Affairs Available from: www.gov.uk/government/publications see p33 - Business Waste.

17.97. The decommissioning of the new structures/buildings has not been assessed as the structures are all permanent structures.

17.98. An assessment of operational impacts in terms of waste is presented in Table 17.19.

Table 17.18: Assessment of the operational impacts

Project Activity	Activities with Potential impacts on material resource / waste	Sensitivity of Receptor	Description of Magnitude	Significance
Operation of logistics park	No manufacturing or processing is expected. There is potential for repackaging to occur	High	Negligible	Slight

PROPOSED MITIGATION

Construction phase

17.99. Measures will be implemented to collectively mitigate the impacts identified from both the use of materials and the management of waste in relation to the Proposed Development. There is significant synergy between materials re-use and the avoidance of the generation of waste, and therefore there is a substantial overlap between the mitigation measures for materials and waste.

17.100. The importance of careful management of materials to promote re-use and waste reduction has been widely recognised by the construction industry. Both legislation and voluntary best practice mechanisms have been developed and implemented. These provide measurable and accountable processes and provide the basis for mitigating environmental effects associated with materials and waste.

17.101. The principal mitigation measure relating to this topic will be the development and implementation of a CEMP, a framework CEMP will be submitted alongside the DCO application. The full CEMP will be developed during the detailed design phase (i.e. before the start of construction) and implemented during the construction phase. The CEMP will include the following:

- details of the approach to environmental management throughout the construction phase, with the primary aim of mitigating any adverse impacts from construction activity on the identified sensitive receptors;

- methods for the prevention and control of any potential short-term construction phase impacts (e.g. construction dust, and the risk of accidental spillages of contaminating materials) and also permanent impacts (e.g. disturbance to vegetation, archaeology and heritage);

- good materials management methods, such as location of temporary haul routes and re-use of temporary works materials from haul routes, plant and piling mats etc; and

- risk/impact-specific method statements and strategic details of how relevant environmental impacts will be addressed throughout the Proposed Development.

17.102. Although not required by the regulations, a Site Waste Management Plan (SWMP) will be developed and regularly updated during the lifetime of the Proposed Development. The SWMP will identify:

- The types and likely quantities of construction, demolition and excavation (CD&E) wastes that may be generated as a result of the proposed development;

- Relevant reuse, recycling and landfill diversion targets applicable to the proposed development; and

- A review of the waste management measures and procedures to be implemented on site during construction in line with relevant legislation, guidance and best practice. These measures would set out how the CD&E wastes would be reduced, reused, managed and disposed of.

Earthworks

17.103. A SWMP could contain a Materials Management Plan (MMP) or the MMP could be a standalone document.

17.104. An MMP will:

- Demonstrate the quantity of material to be reused on site;

- Identify the origin of the material to be used on site, and/or identify the receiver site for surplus material; and

- Demonstrate that the material is suitable for reuse and there would be no risk to either human health or the environment by reusing the material either on site or on the receiver site.

17.105. Implementation of the SWMP and the accompanying MMP would ensure that material reuse is maximised by minimising waste at source (reducing the requirement for new construction materials) and during construction. For example, this could include

screening, crushing, and recycling of demolition materials onsite, or the use of in-situ recycling of tar bound bituminous materials. Further, an MMP allows for imported material to come from donor sites as waste material or material for reuse.

17.106. The assumption in this assessment is that all material from the cut and fill exercise to develop a development plateau would be suitable for reuse onsite. The MMP will control the quantity of this excavated material classified as waste and this may require the material to be managed in accordance with the Definition of Waste: Development Industry Code of Practise (CL:AIRE, 2011).

17.107. The reuse of site won materials would be subject to conformance with material specification and assessment criteria to ensure suitability for use. Any materials that do not initially comply to suitable for use criteria would be treated or processed until suitable for reuse.

17.108. In addition, the MMP will outline the material management options for donor sites. Both for material that remains unsuitable for reuse such as surplus topsoil that may be suitable for use on other donor sites and the Main HNRFI Site could act as a receiver site allowing material from other sites where the material may meet the specifications thus avoiding the waste classification subsequent disposal of material to landfill.

Management of hazardous waste

17.109. It is not expected that any significant quantity of hazardous waste will be produced during the operational phase. Although there will be oily rags and other light plant maintenance wastes that will be hazardous. Any hazardous waste produced during the operational phase will be segregated and stored securely before being disposed of by an approved and appropriately licensed hazardous waste contractor, in accordance with the Hazardous Waste Regulations (as amended 2015) and the associated Hazardous Waste Classification Guidance (2015).

RESIDUAL ENVIRONMENTAL EFFECTS

17.110. Receptors which were assessed with potential to be significantly impacted during the construction phase have been reassessed with the mitigation measures detailed above in place. Careful management of material from the earthworks can avoid material that is not suitable to be reused onsite being sent to landfill. Material designated for an alternative use such as surplus topsoil can be sent to donor sites without classifying the material as waste. In addition, material treated or processed and then reused onsite will reduce what is required for disposal. It is reasonable to assume, that if the material unsuitable for reuse cannot be used onsite then as part of the mitigation in the MMP the material is more likely to be managed in a Waste Transfer Station than sent to landfill. A small proportion of any earthwork material sent to a waste transfer station will get sent to landfill reducing the impact to a negligible significance.

CUMULATIVE AND IN-COMBINATION EFFECTS

17.111. There may be additional impacts on materials use and waste disposal when assessed in combination with other schemes. The assessment of construction waste is included in the baseline assessment within this chapter with a review of capacity capturing the effects from any other scheme currently operating and feeding the landfill sites.

17.112. Regional development will however have an increased drawdown on the regional landfill capacity. Locally, the Hinckley and Bosworth Borough Council Local Plan[25] has identified requirements for somewhere in the region of an additional 9000 homes to be built in Hinckley and Bosworth between 2006 and 2026, with 1150 homes in Hinckley town. Much of this requirement is met by an 850 dwelling housing scheme to the west of Hinckley on Normandy Way, yet to commence to the west of Hinckley. As well as Barwell and Earl Shilton Sustainable Urban Extensions ('SUE') with a further 2500 and 1550 new dwellings respectively. For the purpose of this assessment an increase of 9000 homes is expected to produce an additional 9000 tpa of waste.

17.113. Blaby District Local plan[26] identifies a requirement for a minimum of 8,740 houses to be developed in the Blaby District between 2006 and 2029, and a minimum of 68 hectares of employment land. For the purposes of this assessment, an increase of approximately 9000 homes and 68 hectares of employment land is expected to produce an additional 12,000 tpa of waste.

17.114. The Leicestershire County Council Minerals and Waste Local Plan identifies the potential increase in capacity for minerals and landfill volume and the inclusion of the Proposed Development for mineral requirement and landfill use in its projections going forward. The Barwell and Earl Shilton SUEs were the exception and the plan identified a requirement for new waste sites to be incorporated into the employment land allocated within the master planning of these urban extensions.

SUMMARY AND CONCLUSIONS

17.115. As a nationally significant infrastructure project there is a significant quantity of earthworks required to develop a level development platform with connections to the highway and rail infrastructure. A large volume of material is expected to be required to create a platform for the proposed units and surrounding infrastructure. The design of the earthworks will be optimised to balance requirements of excavation and infill, this will maximise the quantity of material reused onsite and minimises the material disposed off-site.

[25] Hinckley and Bosworth Local Plan 2006 – 2026 Site Allocations and Development Management Policies DPD, Adopted July 2016 Available From: https://www.hinckley-bosworth.gov.uk/downloads/file/5295/site_allocations_and_development_management_policies_dpd_-_adopted_july_2016

[26] Blaby District Local Plan (Core Strategy) Development Plan Document, Adopted February 2013 Available From: https://www.blaby.gov.uk/media/4107/adopted-core-strategy.pdf

17.116. The Waste Hierarchy will be followed through adherence to a Materials Management Plan that will manage all aspects of material re-use, predominantly onsite but, where not suitable, on alternative sites. This will minimise material classified as waste and outline an approach which will maximise the potential to recover material and ultimately prevent the material from being disposed of in landfill.

17.117. It is inevitable that there will be a requirement to import material particularly where large quantities of engineering graded material are required and for the production of concrete. Reuse and recycling material will minimise the volume of material imported, the Main HNRFI Site is well served with a number of quarries in the near vicinity. The Proposed Development also benefits from rail infrastructure which will also be able to deliver material to the Main HNRFI Site from beyond the region. The importation of material is therefore not expected to have a significant impact on the supply of aggregates with the impact assessed as slight adverse.

17.118. Waste generated by the Proposed Development which cannot be reused will have to be taken off-site. The Main HNRFI Site benefits from a range of waste facilities in close proximity to the Main HNRFI Site. With the adherence of the Material Management Plan and the associated reuse of material the quantity of waste would not have a significant impact on the capacity of the landfill sites in the region with the impact assessed as slight adverse.

Tritax Symmetry (Hinckley) Limited

HINCKLEY NATIONAL RAIL FREIGHT INTERCHANGE

Preliminary Environmental Information Report

Chapter 18: Energy and Climate Change

January 2022

This document forms a part of a Preliminary Environmental Information Report (PEIR) for the Hinckley National Rail Freight Interchange project.

A PEIR presents environmental information to assist consultees to form an informed view of the likely significant environmental effects of a proposed development and provide feedback.

This PEIR has been prepared by the project promoter, Tritax Symmetry (Hinckley) Limited. The Proposed Development is described in Chapter 3 of the PEIR and is the subject of a public consultation running from 12 January to 9 March 2022.

Details of how to respond to the public consultation are provided at the end of Chapter 1 of the PEIR and on the project website:

http://www.hinckleynrfi.co.uk/

This feedback will be taken into account by Tritax Symmetry (Hinckley) Limited in the preparation of its application for a Development Consent Order for the project.

Chapter 18 ◆ Energy and climate change

INTRODUCTION

18.1 This Chapter has been prepared by BWB Consulting Ltd and reports the assessment of the likely significant effects of energy and climate change, both upon and from the Proposed Development.

18.2 Scientific evidence links greenhouse gas (GHG) emissions associated with human activity to global warming (an increase in the global mean surface temperature) which is triggering changes to the global climate system. The resultant impact of climate change is evident through sea level rises and increasing occurrence of extreme weather events.

18.3 Climate change will continue to cause damage to the environment and compromise economic development. Climate change mitigation is essential to minimise the most dangerous impacts of climate change, as previous global greenhouse gas emissions have already committed us to some degree of continued climate change for at least the next 30 years. Climate change is likely to mean that the UK will experience hotter, drier summers and warmer, wetter winters. There is an increased risk of flooding, drought, heatwaves, intense rainfall events and other extreme events such as storms and wildfires, as well as rising sea levels. In this regard, it is appropriate to assess the impact of projects on climate (for example greenhouse gas emissions) and their vulnerability to climate change.

18.4 By nature of new development, the construction and operation of new infrastructure results in GHG emissions. As such, Tritax Symmetry (Hinckley) Limited (TSH) has given careful consideration to how the Proposed Developments contribution to climate change can be minimised, which includes commitments embedded in design and set-out in the Design and Access Statement.

18.5 This chapter therefore presents the assessment of:

- climate change resilience - the vulnerability of the Proposed Development to the potential impacts of climate change in particular impacts from extreme weather and long-term climate change during construction and operation; and

- a GHG emissions assessment - the potential effects of the Proposed Development on the magnitude and mitigation of Greenhouse Gases (GHGs) emitted during construction and operation.

18.6 The energy and sustainability assessment, submitted in support of the application, will review and respond to the local authority specific energy criteria contained in the Core Strategy and other local policy documents.

Competence

18.7 This report has been prepared by BWB Consulting Ltd ('BWB'); Matt Wilby (Associate Member of the Institute of Environmental Management and Assessment, IEMA) and approved by Chris Miller-Jones. Matt has over 10 years' experience in the built environment sector, specialising in the environmental appraisal of construction and operational effects on large scale projects both nationally and internationally and including the effects of climate change over the last 5 years. Chris has nearly 25 years of industrial and commercial experience in sustainable design and construction sustainable design and construction. Both Matt and Chris are experienced in climate change policy in addition to BWB's experience in whole life GHG emission assessments for planning applications.

18.8 Specialist input on natural capital has been provided by RPS (for extensive knowledge of mechanical and electrical networks and applications), BasePower (an award-winning consultancy specialising in low-carbon solutions) and Ridge LLP (for direction on low-carbon construction solutions).

LEGISLATION, POLICY AND GUIDANCE

Legislative and policy framework – international legislation

18.9 The international and legislative framework for the consideration of climate change and greenhouse gas emissions established the basis for the approach to the assessment methodology. The legislative background is briefly set out below along with the approach to the legislative requirements through policy.

Paris Agreement

18.10 The Paris Agreement[1] sets out a global framework to avoid dangerous climate change by limiting global warming to well below 2 degrees Celsius (°C) and pursuing efforts to limit it to 1.5°C. It also aims to strengthen countries ability to deal with the impacts of climate change and support them in their efforts. This Agreement is the first-ever universal, legally binding global climate change agreement, adopted at the Paris climate conference ('COP21') in December 2015.

Directive 2014/52/EU on the Assessment of the Effects of Certain Public and Private Projects on the Environment (the EIA Directive)

18.11 European Directive 2014/52/EU on the assessment of the effects of certain public and private projects on the environment (the EIA Directive)[2] provides the overarching legislative framework for assessing the significance of impacts and effects from the

[1] United Nations Climate Change (2015): The Paris Agreement. Available at: https://unfccc.int/process-and-meetings/the-paris-agreement/the-paris-agreement

[2] Directive 2014/52/EU of the European Parliament and of the Council of 16 April 2014 amending Directive 2011/92/EU on the Assessment of The Effect of Certain Public and Private Projects on The Environment (2014). Available at: https://eurlex.europa.eu/legalcontent/EN/TXT/PDF/?uri=CELEX:32014L0052&from=EN

schemes on the environment.

18.12 The Directive requires environmental impact assessments (EIAs) to identify, describe and assess the direct and indirect significant effects of a project on climate (Article 3). It also stipulates that the information to be included within the Environmental Statement (ES) should include '*the impact of the project on climate (for example the nature and magnitude of GHG emissions) and the vulnerability of the project to climate change*' (Annex IV).

18.13 The requirement to consider a project's effects in relation to climate resulted from the 2014 amendment to the EIA Directive (2014/52). The Directive has been fully transposed into UK law in the Infrastructure Planning (Environmental Impact Assessment) Regulations and came into force in the UK on the 16 May 2017[3]. The Directive requires: '*A description of the likely significant effects of the project on climate (for example the nature and magnitude of GHG emissions) and the vulnerability of the project to climate change*'.

Legislation and policy framework - national legislation and policy

UK Climate Change Act 2008

18.14 The Climate Change Act 2008[4] established a legal requirement for an 80% reduction in the GHG emissions of the UK economy by 2050 in comparison to a 1990 baseline. The Act also created the Committee on Climate Change, with a responsibility for:

- setting five-year carbon budgets, covering successive periods of emissions reduction to 2050;
- advising and scrutinising the UK Government's associated climate change adaptation programmes; and
- producing a national adaptation plan for the UK Government to implement.

18.15 In 2019, the target was revised to achieve 100% reduction (net zero) GHG emissions by 2050.

18.16 In December 2020, the UK announced plans to reduce GHG emissions by at least 68% by 2030 in comparison to a 1990 baseline[5]. This replaced the previous target of a 53% reduction by 2030.

[3] The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017. Available at: http://www.legislation.gov.uk/uksi/2017/572/contents/made
[4] HM Government (2008) Climate Change Act 2008. Available at: http://www.legislation.gov.uk/ukpga/2008/27/introduction
[5] https://www.gov.uk/government/news/uk-sets-ambitious-new-climate-target-ahead-of-un-summit

The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017[6]

18.17 Schedule 4, Clause 5(f) of these Regulations notes information should be included in the ES on the likely significant effects of the Proposed Development on the environment resulting from 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*'.

Infrastructure Carbon Review 2013

18.18 In 2013, the UK government published the Infrastructure Carbon Review[7] aiming to '*release the value of lower carbon solutions and to make carbon reduction part of the DNA of infrastructure in the UK*' (page 5). Major infrastructure owners, operators and developers, including Highways England (HE), were invited to endorse, become signatories and make commitments under the review. The review provided increased emphasis on 'capital carbon' (GHG emissions associated with raw materials, activities and transport for construction, repairs, replacement, refurbishment and de-construction of infrastructure) while acknowledging that 'operational carbon' (associated with energy consumption for the operation and use of infrastructure) will continue to dominate overall emissions to 2050 and beyond. The Infrastructure Carbon Review highlighted the importance of assessing GHG emissions early in the lifecycle of an infrastructure scheme when there is the greatest carbon reduction potential. The Infrastructure Carbon Review also led to the publication of a Publicly Available Specification on infrastructure carbon management; PAS2080:2016[8].

Department for Transport's National Policy Statement for National Networks 2014

Government's Policy for Addressing need for SRFIs

18.19 Government policy for nationally significant infrastructure rail and road projects within England, and the need that underpins this, is set out in the National Policy Statement (NPS) for National Networks 2014[9].

18.20 A key driver identified for the national rail network is to provide for the transport of freight across the country, and to and from ports, in order to help meet environmental goals and improve quality of life.

18.21 Paragraph 2.35 states that 'Rail transport has a crucial role to play in delivering significant reductions in pollution and congestion. Tonne for tonne, rail freight produces 70% less CO_2 than road freight, up to fifteen times lower NOx emissions and nearly 90% lower PM_{10} emissions. It also has de-congestion benefits – depending on its load, each freight train can remove between 43 and 77 HGVs from the road.'

[6] Her Majesty's Stationary Office (HMSO), (2017). The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017. The Stationary Office.
[7] HM Treasury (November, 2013); Infrastructure Carbon Review.
[8] British Standards Institution (May, 2016); Carbon Management in Infrastructure (PAS2080:2016).
[9] Department for Transport (December, 2014); National Policy Statement for National Networks

Climate Change Adaptation

18.22 The NPS also sets out Government policy on climate change mitigation and adaptation, and in particular how applicants should take climate change effects into account when developing infrastructure.

18.23 Because of the impacts of climate change, 'Adaptation is therefore necessary to deal with the potential impacts of these changes that are already happening. New development should be planned to avoid increased vulnerability to the range of impacts arising from climate change' (Paragraph 4.38).

18.24 The NPS specifies the following to ensure a robust approach to climate change adaptation:

'Where transport infrastructure has safety-critical elements and the design life of the asset is 60 years or greater, the applicant should apply the UK Climate Projections 2009 (UKCP09) high emissions scenario (high impact, low likelihood) against the 2080 projections at the 50% probability level. (Paragraph 4.41)

The applicant should take into account the potential impacts of climate change using the latest UK Climate Projections available at the time and ensure any environment statement that is prepared identifies appropriate mitigation or adaptation measures. This should cover the estimated lifetime of the new infrastructure. Should a new set of UK Climate Projections become available after the preparation of any environment statement, the Examining Authority should consider whether they need to request additional information from the applicant. (Paragraph 4.42)

The applicant should demonstrate that there are no critical features of the design of new national networks infrastructure which may be seriously affected by more radical changes to the climate beyond that projected in the latest set of UK climate projections. Any potential critical features should be assessed taking account of the latest credible scientific evidence…(Paragraph 4.43)

Any adaptation measures should be based on the latest set of UK Climate Projections, the Government's national Climate Change Risk Assessment and consultation with statutory consultation bodies. Any adaptation measures must themselves also be assessed as part of any environmental impact assessment and included in the environment statement, which should set out how and where such measures are proposed to be secured.' (Paragraph 4.44)

18.25 The NPS also states that climate change adaptation measures should not cause '*an adverse effect on other aspects of the project and/or surrounding environment*' (Paragraph 4.47).

National Planning Policy Framework (NPPF) 2021

18.26 The revised NPPF (last updated July, 2021[10]) sets out the core planning principle of '*moving to a low carbon economy*': Chapter 9: Promoting Sustainable Transport, encourages the pursuit of '*…opportunities to promote walking, cycling and public transport'* as well as '*limiting the need to travel and offering a genuine choice of transport modes*' (Paragraph 73).

18.27 In accordance with NPPF Chapter 14: Meeting the challenge of climate change, flooding and coastal change; 'The planning system should support the transition to a low carbon future in a changing climate, taking full account of flood risk and coastal change. It should help to:

- *shape places in ways that contribute to radical reductions in GHG emissions;*
- *minimise vulnerability and improve resilience;*
- *encourage the reuse of existing resources, including the conversion of existing buildings; and*
- *support renewable and low carbon energy and associated infrastructure" (Paragraph 152).'*

Building Regulations

18.28 The Building Regulations, specifically Approved Document Part L2A; '*Conservation of Fuel and Power in new buildings other than dwellings*'[11], determine the energy efficiency and carbon emission standards required by new buildings. Part L addresses controls for:

- insulation values of buildings elements;
- the allowable area of windows, doors and other opening;
- the air permeability of the structure;
- the heating efficiency of boilers;
- hot water storage and lighting;
- mechanical ventilation and air conditioning systems;
- space heating controls;

[10] Ministry of Housing Communities & Local Government (2021); National Planning Policy Framework

[11] https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/540326/BR_PDF_AD__L1A__2013_with_2016_amendments.pdf

- airtightness testing of larger buildings;
- solar emission; and
- requirements for Carbon Index ratings.

Legislation and policy framework – regional policy

Leicestershire County Council

Environment Strategy 2018 – 2030

18.29 LCC declared a climate emergency in 2019. Their Environment Strategy 2018 - 2030[12], which was revised to reflect this emergency declaration, sets out the council's commitment to carbon neutrality by 2030 and enforces LCC's commitment to '*minimising its environmental impacts, protecting and enhancing the Leicestershire environment and helping to deliver sustainable development by recognising and fostering the links between the environment, people and our economy*'.

18.30 This Strategy will be updated every 5 years to be 'consistent with 'stocktakes' as agreed in the Paris Agreement and the timeframes used for the UK Government's carbon budgets'.

Legislation and policy framework – local policy

Blaby District Council (BDC)

Blaby District Local Plan 2013 - 2029

18.31 Strategic objectives set out by the plan in Policy CS21 – Climate Change include:

- to minimise energy use and use of valuable resources and to encourage renewable energy production in suitable locations;
- to minimise the risk of flooding (and other hazards) to property, infrastructure and people; and
- to deliver the transport needs of the District and to encourage and develop the use of more sustainable forms of transport (Including walking, cycling and public transport).

18.32 The plan supports development which mitigates and adapts to climate change. BDC will *"contribute to achieving national targets to reduce greenhouse gas emissions by:*

- *focussing new development in the most sustainable locations; and*
- *seeking site layout and sustainable design principles which reduce energy demand and increase efficiency*.'

[12] https://data.climateemergency.uk/media/data/plans/leicestershire-county-council-de0442d.pdf

'The Council recognises that preparing for the effects of climate change (adaptation) by minimising vulnerability and providing resilience is also important. Some degree of climate change is already inevitable, and is likely to have a range of impacts, including increased temperatures in the summer and increased risk of flooding or droughts. The Council will encourage development to plan for these impacts recognising the role of Green Infrastructure in bringing together important considerations of biodiversity, heat, water, healthy living and transport needs to create environments in which people want to live and work in the future. Good site selection is also important, particularly in relation to flooding and water resources.'

Blaby District Council Climate Change Strategy 2020 – 2030

18.33 Although BDC have not declared a climate emergency, they created a Climate Change Strategy. The BDC Climate Change Strategy 2020 – 2030[13] identifies six overarching aims to meet the challenges of climate changes. The aims most relevant to this assessment include:

- *'significantly reduce our carbon emissions by increasing the use of renewable energy, reducing the demand for energy and protecting and enhancing carbon sinks;*
- *reduce the environmental impact of travel and transport across the district, recognising that this is the biggest greenhouse gas emitting activity in the district;*
- *actively support the development of a sustainable travel network. Based on significant shifts in the mode of travel to active transport (walking and cycling), promoting the use of public transport and developing electric vehicle infrastructure; and*
- *improve air quality by complementing and supporting transport policy that promotes cycling and other healthy and sustainable travel options.'*

Hinckley and Bosworth Borough Council

Local Development Framework (LDF) – Core Strategy 2006 - 2026

18.34 Thirteen Spatial Objectives were identified in the Hinckley and Bosworth Borough Council (HBBC) core strategy to ensure the strategy's vision is achieved. The following objective specifically relates to climate change:

- Spatial Objective 12: Climate Change and Resource Efficiency – '*To minimise the impacts of climate change by promoting the prudent use of resources through sustainable patterns of development, investment in green infrastructure (GI), minimising the use of resources and energy, increasing reuse and recycling of natural resources, increasing the use of renewable energy technologies and minimising pollution, including greenhouse gas emissions*.'

[13] Blaby District Council (2019): Climate Change Strategy 2020 – 2030.

HBBC Climate Emergency

18.35 HBBC declared a climate emergency in 2019. Although a Climate Change Action Plan is yet to be completed, HBBC has set *'the target of becoming carbon neutral by 2030'*[14].

APPROACH AND METHODOLOGY

18.36 The likely significant environmental effects to be considered within this Energy and Climate Change chapter are as follows:

- the vulnerability of the Proposed Development to climate change;
- the influence of the Proposed Development on climate change; and
- the in-combination climate change impacts assessment.

18.37 It was proposed in the Scoping Report (dated November 2020) to address the request for a climate change chapter with a focussed quantitative and qualitative approach, that is proportionate that will draw on recognised climate change projections, existing guidance and emerging good practice[15,16] as well as being informed by relevant information presented in other chapters of the ES and further documents which form part of the application. As such, an effective balance between the assessment of GHG emissions emitted by the Proposed Development and consideration in the absence of detailed design information required to fulfil a comprehensive GHG assessment of the construction process and buildings functions has been recommended. Nevertheless, where it is not possible to quantify effects, the practitioner, will qualitatively define the boundaries of the GHG assessment and identify where the majority of emissions are likely to arise from and outline appropriate mitigation strategies to inform later design practice.

18.38 Adopting a precautionary approach to the assessment, recommendations will be made to reduce unmitigated emissions and incorporate mitigation measures (such as renewable energy sources and low carbon materials) into the Proposed Developments design where appropriate. Where a qualitative assessment has been deemed unfeasible, the consultant will recommend that further assessment is conditioned at an appropriate stage to ensure minimum target reductions are achieved.

The 2020 Scoping Opinion

18.39 An EIA Scoping Report was submitted to the Planning Inspectorate (PINS) in November 2020 which provided an outline approach for the identification and

[14] https://www.hinckley-bosworth.gov.uk/info/200386/climate_change/1739/climate_change_strategy
[15] IEMA (2020): Assessing Greenhouse Gas Emissions and Evaluating their Significance
[16] IEMA (2020): Climate Change Resilience and Adaptation

assessment of likely significant effects for air quality.

18.40 In December 2020 PINS, on behalf of the Secretary of State (SoS) and key stakeholders, returned their Scoping Opinion to the Applicant and comments related to air quality are provided in Table 18.1.

Table 18.1: Planning Inspectorate's comments from EIA Scoping Opinion in relation to energy and climate change (December 2020)

Secretary of State	Scoping Opinion Response	Response to Comments
Baseline assessment	The Scoping Report does not explain how the study area(s) for the assessment will be defined. The ES must explain and justify the study area(s) used in the assessment.	Effort has been made to define the study area within the parameters of best practice guidance, including the Rochdale Envelope. The study area is defined in paragraphs 18.50 and 18.51.
Receptors	It is not clear from the Scoping Report whether the proposed energy and sustainability assessment will be qualitative or quantitative or how it will deal with the inherent uncertainties around the generation of greenhouse gases over the lifetime of the Proposed Development. Paragraphs 17.17 and 17.18 of the Scoping Report state that the strategy will be included within a separate document to the ES with the environmental impacts relating to air, land, noise, light and water resulting from buildings and energy generation equipment to be covered under other relevant aspect chapters of the ES. However, elsewhere in the Scoping Report there is no reference to how impacts from the Proposed Development to climate will be assessed. As advised in section 3 of this Scoping Opinion, the ES must assess the effects of the Proposed Development on climate and the vulnerability of the project to climate change. It must clearly explain the reasoning and assumptions behind conclusions reached. It must explain the significance of effect and the criteria used to determine significance. Wherever	The assessment is formed of two distinct climate change appraisals which should be considered independently, these are: • Climate Change Resilience; and • A GHG Emissions Assessment. Some aspects of the design have not been finalised at this stage. As a result, some data is not available to provide a quantified assessment of the GHG emissions from the construction and operation of the proposed development. The GHG assessment presented here is therefore a mix of quantitative and qualitative, according to data availability. The GHG assessment seeks to quantify, where feasible, the potential effects of the Proposed Development on the magnitude and mitigation of Greenhouse Gases (GHGs) emitted during construction and operation. The application will be supported by a stand-alone Energy strategy and Design and

Secretary of State	Scoping Opinion Response	Response to Comments
	possible the assessments should be quantitative rather than qualitative.	Access statement which set out defined management practices and include embedded mitigation to reduce the effects of the This assessment presented in this PEIR quantifies the effects of energy on GHGs. Given the preliminary nature of this report, some effects have not been quantified for the purposes of PEIR but are appraised qualitatively. Effects will be quantified for submission will be made to do so for the ES. The assessment of resilience addresses the vulnerability of the proposals from the potential impacts of climate change; in particular impacts from extreme weather and long-term climate change during construction and operation has been undertaken qualitatively, but is enforced by the quantitative assessments for each respective topic element. This qualitative approach adheres to best practice guidance.
Use of UKCP09 High Emissions Scenario	The ES should take into account the potential impacts of climate change using the latest UK Climate Projections, this should include the anticipated UKCP18 projections where appropriate.	The Assessment utilises and applies the most valid and recent data available in accordance with best practices; the assessment seeks to utilise both UKCP09 and UKCP18 projections; in some limited circumstances UKCP09 projections are required in lieu of UKCP18 data sets.
Scope of energy and carbon dioxide emissions assessment	The Scoping Report states that the scope of the energy and carbon dioxide (CO_2) emissions assessment will cover all building and process loads. It is not clear whether this will include emissions during construction or from the traffic movements associated with the operation of the Proposed Development.	At this stage, the absence of available data is a limitation, particularly for calculating the embodied carbon (ie. energy and materials) of the Proposed Development. Where data has not been available, estimates (using professional

Secretary of State	Scoping Opinion Response	Response to Comments
	The ES should include an assessment of the effects of the project on climate where significant effects are likely to occur.	judgment and knowledge from similar developments) have been used. In the absence of detailed data. Where particular information was not able to be specified at this stage, assumptions and omissions have been clearly stated. Omissions will be quantified for submission. Where activity data[17]. has allowed, GHG emissions have been quantified using a calculation-based methodology as per the following equation as stated in the Department for Environment, Food and Rural Affairs (DEFRA) 2018 emissions factors guidance.

Assessing effects of the Proposed Development on climate change (GHG's)

18.41 As set out in the EIA Scoping Report (dated November 2020), a number of edits and alterations have been made to the methodological approach following review of the consultation responses to the 2018 opinion.

18.42 The GHG assessment relates to the effects of the Proposed Development on GHG emissions contributing to climate change. The Proposed Scheme will be assessed within the context of the UK's evolving carbon agenda as set-out above.

18.43 GHGs will be considered as part of the Transport Assessment (TA) relating to traffic impacts, and with regard to the benefits of enabling a shift from road to rail. A direct assessment of carbon emissions is understood not to be required for non-highway Nationally Significant Infrastructure Projects (NSIPs) and, given the absence of detailed design information required to fulfil a comprehensive and meaningful GHG assessment of buildings, it is proposed that a quantitative appraisal of buildings sources will not be undertaken. The application is supported by a separate 'Energy/ Sustainability Strategy' and Design and Access Statement which set-out mitigation in respect of energy minimisation and efficiency which are embedded in design.

18.44 Scenarios of current and future baselines will be built on the changing travel patterns and modal shift for operational circumstances. Baseline transport data will be based

[17] Activity data is data based on a unit quantity of input or output from activities proposed during the construction and operation of the Proposed Development resulting in GHG emissions for example quantities of diesel in litres

on the latest model as detailed in Chapter 8: *Transport and traffic*. The transport model reports on travel patterns by mode (road) on the route of the Proposed Development. Transport efficiency improvements over time will also be considered. The impact that the Proposed Scheme has on freight is also assessed using rail freight projections provided by Baker Rose Consulting.

18.45 As there is no specific standard for reporting infrastructure GHG emissions in EIA, it is proposed to undertake a quantitative appraisal identifying causes of, and where possible, limiting the potential for effects from direct emissions associated with vehicle movements during the construction phase. An indicative assessment for vehicular emissions was determined for each scenario using applicable traffic data and Department of the Environment, Food and Rural Affairs (DEFRA) Emission Factors Toolkit (EFT) version 10.1 , deemed suitable for large scale and high-level applications. The EFT allows users to calculate road vehicle pollutant emission rates for NOx, PM_{10}, $PM_{2.5}$ and CO_2 for a specified year, road type, vehicle speed and vehicle fleet composition[18].

18.46 The EFT is updated periodically due to updates to underlying data including vehicle fleet composition and emissions factors. Users are therefore advised to check this page regularly to ensure they are using the most up to date version of the tool for their studies.

18.47 Though it is recognised that a new version of the EFT (version 11.0) was released in late November 2021, the assessment was undertaken to an appropriate level of detail, commensurate with the information available at the time of writing. It is understood by the Planning Inspectorate (Advice Note 17, Paragraph 3.4.9) that applicants must stop assessment work at a particular point in time in order to be able to finalise and submit an application. The default fleet projections in EFT v11.0 are based on fleet growth assumptions which were current before the Covid-19 outbreak in the UK. In consequence, default fleet outputs from the tool do not reflect short or longer term impacts on emissions in 2020 and beyond resulting from behavioural change during the national or local lockdowns. It is therefore considered that version 10.1 remains suitable for the purposes of this PEIR but will be updated accordingly prior to the submission of the Environmental Statement.

18.48 Emissions associated with rail were calculated using the Greenhouse Gas Protocol toolkit for 'GHG Emissions from Transport or Mobile Sources'. These sources are indirect emissions and are considered Scope 3 for reporting purposes. The tool uses default emission factors, therefore the tool applies either UK specific values or global default values where UK values are not available. The emission factors used in this tool come from DEFRA in the UK, the US Environmental Protection Agency (EPA) and the Intergovernmental Panel on Climate Change's (IPCC) 2006 Guidelines for National Greenhouse Gas Inventories. The tool was developed by Clear Standards Inc. in

[18] Department for Environment Food & Rural Affairs: Emissions Factors Toolkit. Available online at: https://laqm.defra.gov.uk/air-quality/air-quality-assessment/emissions-factors-toolkit/

collaboration with WRI[19].

Study area

18.49 The GHG Study Area includes all GHG emissions from within the Main HNRFI Site boundary area arising during the operation of the Proposed Development. In time, it will also include emissions arising from construction, such as transport and, where possible, treatment of materials and waste disposal.

18.50 A study area for the baseline conditions cannot clearly drawn as the scale of the impact considered in the context of atmospheric GHG concentrations is considered global. Reference has been made to the global context as appropriate, however, for the purposes of this assessment, the study area primarily relates to affected transport network as set-out in Chapter 8: *Transport and traffic* and Chapter 9: *Air quality.*

Identifying sensitive receptors

18.51 The local, regional, national and global environment within which GHG emissions are emitted is considered the sensitive receptor within the assessment.

18.52 As set out in the EIA Scoping Report (dated November 2020), significant sources of GHG emissions which have been assessed are those summarised in Table 18.2.

Table 18.2 – Summary of significant GHG emissions sources

GHG Emissions Sources	Description
Occupiers (Transport)	User behaviour during the operational phase, including heavy duty vehicles (HDV's) associated with general functionality.
Operational Requirements	On-site energy consumption and generation.
Transport	Business travel, employee commuting and other vehicular trips that start or end within the community
Construction (qualitative)	Direct sources of GHG emissions associated with vehicle and plant movements and function.

18.53 As set out in the EIA Scoping Report (dated November 2020) the GHG emissions sources set out in Table 18.3 have been excluded from the assessment. Whilst it is recognised that the infrastructure provided can lock-in positive or negative user behaviour in operation, the GHG emissions are influenced by a number of factors beyond design decisions that cannot be quantified at this early stage of the Proposed Development. Where feasible, qualitative appraisals have been provided.

[19] Greenhouse Gas Protocol: GHG Emissions Calculation Tool. Available online at: https://ghgprotocol.org/ghg-emissions-calculation-tool

Table 18.3 – GHG emissions sources excluded from the assessment

GHG Emissions Sources	Description
Natural Capital	Green and blue infrastructure (e.g. soft landscaping, water bodies, sustainable drainage features)
Direct GHG (Energy)	Operational energy – On-site fuel combustion (e.g. gas, biomass, and other forms of energy generation)
Indirect GHG (Energy)	Operational energy – Off-site generation (e.g. Grid electricity, heat and steam).
Indirect GHG (Construction)	Embodied carbon associated with construction (materials, construction process, in-use building component maintenance and eventual demolition)
Water	Water demand associated with the non-domestic buildings
Solid Waste	Waste arising from building occupants and visitors (non-domestic buildings and different housing typologies)

Baseline data collection

Construction

18.54 Some aspects of the design have not been finalised at this stage. As a result, some data is not available to provide a quantified assessment of the GHG emissions from the construction and operation of the proposed development. The GHG assessment presented here is therefore a mix of quantitative and qualitative, according to data availability. Where particular information was not able to be specified at this stage, assumptions and omissions have been clearly stated. These include:

18.55 **Energy**: the regulated energy CO_2 emission values will be quantified from the Energy and Sustainability Report submitted in support of the planning application.

18.56 **Emissions from land clearance** were not quantified in this assessment as the emissions from loss of carbon stock would be minimal as the existing site consists of low carbon vegetation and the landscaping in the design allows for replacement of carbon stock. Any net changes in carbon stock are expected to be small in comparison to the overall construction emissions.

18.57 There is expected to be a potential net increase in carbon stock as a result of landscaping, but this has not been quantified as the detailed design is not finalised at this stage.

18.58 It has not been possible to quantify **GHG emissions from worker commuting** as estimates of worker numbers are not yet available. HGV movements are expected to be 15% of the operational flows and are therefore not considered significant when compared with the worst case scenario. A quantified assessment of the effects of

vehicular emissions during construction will be provided in the ES.

18.59 A detailed construction plant schedule is not available at this stage. Only a qualitative assessment of emissions from on-site construction activities has therefore been provided.

Operational traffic

18.60 At this stage of the PEIR, the construction programme for the HNRFI Site has been set out in an indicative programme in Chapter 3 and assessed, more detail on construction traffic movements will be included for the final submission, including details of material removal, construction traffic management and environmental management. Further detail on this information will be included in the Construction Environmental Management Plan (CEMP) The operational assessment assumptions are based on the scenarios modelled with the appropriate Pan Regional Transport Model (PRTM). A such this assessment for PEIR is based on the following assessment scenario: Operational Year 2036 With Development.

18.61 24-hour annual average daily traffic (AADT) flows for Light Duty Vehicle ('LDV') and Heavy Duty Vehicles ('HDV') were provided by the transport consultants for the following scenarios and set-out in Table 18.4:

- Baseline year without the Proposed Development (2019);
- Future Year 'Do-minimum' (without the Proposed Development, 2036); and
- Future Year 'Do-something' (with the completed Proposed Development, 2036).

Table 18.4: Traffic data assumptions

	Baseline Year (2019)		Do Minimum (2036)		Do Something (2036)	
	LDV	HDV	LDV	HDV	LDV	HDV
Total Network*	18,516,355	1,695,412	18,103,827	1,665,935	18,339,862	1,859,973
**Daily Occupier Increase*	-	-	-	-	*16,438*	*8,998*
**All values 24-hour AADT. Trips are two-way* ***predicted traffic generation by the Proposed Development is based upon flows as set-out in Chapter 8: Transport and Traffic*						

18.62 Fleet composition was provided in the form of a uniform HDV/LDV split for each trip rates expected to be generated under construction and operational circumstances. Mean vehicle speeds for the links used in the assessment were estimated as an average based on maximum permitted speeds in the area and analysis of the road. In

the absence pre-defined distances for commuter vehicles ('LDV'), the most recent UK average journey distance as defined by the National Travel Survey[20] (8.4 miles/13.1 km) was applied. The roads were classified as 'England (not London)' as applicable. Assumptions of the annual inputs used in the carbon modelling are provided in the Table 18.5.

Table 18.5: Annual inputs used in the carbon modelling

Proposed Development Site Traffic (Do Something (2036)	
Average Link Length (LDV)	13 km
Average Link Length (HDV)*	75 km
Road Type	England (not London)
Assumed load	100%
Average vehicle speed ***	68 kph / 42mph
**Average link length as set-out by AECOM (2018): Hinckley National Rail Freight Interchange Strategic Modelling: Proposed Development Trip Distribution* ***Based upon the average of posted speed limits (30, 60 and 70 mph) of the roads surrounding the Proposed Development*	

18.63 Due to COVID-19, current timetabling for the rail passage is not reflective of normal operational circumstances. Furthermore, publicly available timetabling does not account for rail freight. Rail assumptions are therefore calculated on the assumptions as set-out and verified by Baker Rose Consulting LLP, the appointed rail consultant, who provided the rail capacity modelling.

18.64 During operations, rail freight is expected to increase by a total of 16 trains a day (32 movements). It is expected that Class 66 and 70 (both diesel) trains will comprise the majority of this fleet, with some (up to 2) Class 768 (bimodal diesel electric) trains facilitating delivery. Both the Class 66 and 70 are diesel-electric freight locomotives, with two-stroke diesel noted as the prime mover.

18.65 Average freight you can expect an average train weight to be about 3,000 to 18,000 tonnes or more depending on the load and number of cars in the train[21]. The mean weight of a freight train (10,500 tonnes) has therefore been used for GHG calculations. The average length of a singular rail freight haul is approximately 150km[22].

Determining significance

18.66 In the absence of any significance criteria or a defined threshold, it might be

[20] Department for Transport (2019); National Travel Survey England. Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/906276/national-travel-survey-2019.pdf

[21] Department for Transport (December 2019): Transport Statistics Great Britain 2019.

[22] Government for Science (February 2019): Understanding the UK Freight Transport System.

considered that all carbon emissions are significant and beneficial effects only arise if there is a net loss in carbon and emissions. As per the IEMA guidelines (2017) when evaluating significance, all new GHG emissions contribute to a significant negative environmental effect; however, some projects will replace existing development that have higher GHG profiles. The significance of a project's emissions should therefore be based on its net impact, which may be positive or negative. EIA should ensure an assessment addresses the occurrence of GHGs by taking mitigating action. Whilst there is no single preferred method to evaluate significance given this topic is emerging within EIA, the approach to determining the significance of effects has applied available guidance, standard industry practice and professional judgment; the effects have therefore been defined and compared against UK Carbon Budget Targets as set out in Table 18.6.

Table 18.6: Significance criteria for GHG emissions

Effect Significance	Description of Criteria (Emissions from Road Traffic (CO_2))
Negligible	Emissions are equal to the emissions predicated in the 2036 'Do Minimum' baseline.
Minor	An increase in emissions predicated in the 2036 'Do Minimum' scenario, but less than 1% of total emissions from the relevant 5-year UK carbon budget and with a commitment to reasonable and deliverable measures to seek to reduce these emissions in accordance with relevant policy and guidance.
Moderate	An increase in emissions predicated in the 2036 'Do Minimum' scenario, but less than 1% of total emissions from the relevant 5-year UK carbon budget and without a commitment to reasonable and deliverable measures to seek to reduce these emissions, in accordance with relevant policy and guidance.
Major	An increase in emissions predicated in the 2036 'Do Minimum' scenario, that results in GHG emissions representing greater than 1% of total emissions from the relevant 5-year UK carbon budget in which they arise.

18.67 The following terms have been used to define the significance of the effects identified:

- minor: slight, very short or highly localised effect;
- moderate: limited effect (by extent, duration or magnitude) which may be considered significant; and
- major: considerable effect (by extent, duration or magnitude) of more than local significance or in breach of recognised acceptability or standards.

Assessing in-combination effects

18.68 The in-combination climate change impacts assessment relates to the combined effect of the impacts of the Proposed Development and potential climate change

impacts on the receiving environment.

18.69 In line with IEMA guidance, the combined effect of the impacts of the Proposed Development and potential climate change impacts on the receiving environment are referred to as 'in-combination impacts' and 'in-combination effects'.

Applying mitigation

18.70 Suitable mitigation measures to address adverse effects on the ability of resources and receptors to adapt to climate change will be developed by other topical specialists contributing to the ES. For example, for in- combination climate change impacts relating to flood risk, climate change projections based on current Environment Agency (EA) guidance will be used in the relevant flood risk assessment (FRA). The assessment of potential climate change impacts on the effects associated with the Proposed Development will be undertaken in accordance with timeframes outlined in the methodologies for each topic.

Assumptions and limitations to assessing the effects of GHGs

18.71 The assumptions and limitations which apply to this assessment are outlined in Table 18.7. For each assumption or limitation, an explanation of the possible effect of the assumption has been provided as well as a description of any corrective actions that have been taken to adjust for any limitations. These assumptions are considered reasonable and are not likely to impact on the outcome of the assessment.

Table 18.7: GHG assessment assumptions and limitations

Assumption / Limitation	Consequence	Resolution
There is currently no specific guidance or carbon emissions threshold, which, if exceeded, is considered significant.	The assessment has not been undertaken in line with specific guidelines or standards.	Professional judgement based on experience and knowledge of similar schemes and current guidance as identified have been used to make the assessment.
Data on the anticipated transportation distance for materials brought to site and wastes taken from site are not available and have been based on average journey distances as defined by the National Travel	The transportation distances are considered reasonable based on professional judgement. Any changes to the distances could be considered to materially affect the chapter outcomes.	The transportation distances have been used to complete the Highways England Carbon Tool to calculate construction phase GHG emissions.

Assumption / Limitation	Consequence	Resolution
Survey[23].		
The future traffic levels for the assessment of the Proposed Development are based upon an opening year predicted to be in 2026. An operational period of 60 years has been assumed for the assessment of GHG emissions.	N/A	To model the GHG emissions, the assessment has taken into account the proportions of the vehicle types, fuel type, forecast fuel consumption parameters and emission factors were used for the opening date 2036.
The most accurate way to calculate emissions from rail freight is to use direct measurements of fuel used. Given that the most commonly used metric in rail freight is tonne km.	Fuel usage in rail freight will vary significantly across different locomotives and other factors such as the gradient of the route and weight / length of the freight train. Therefore, it is recommended that where possible operators try to measure or estimate fuel use more directly, and use this as the basis of their emissions calculation[24]. This information is not available for the extent of the rail network and as the type and quantity of fright is yet to be defined and variable, it has not been directly assessed.	To estimate the effects of GHG emissions from freight, the assessment has taken into account the average savings as defined from the total number of trains expected per day using annual statistical data released for freight trains in the United Kingdom. Freight train data has been normalised to show the average CO_2e emission per net tonne kilometre of freight moved.
Limitations associated with the approach taken for the ICCI assessment relate to uncertainties inherent within UKCP18 Projections.	Climate change, by its very nature, is associated with a range of assumptions and limitations. For example, there is uncertainty regarding how global climatic trends will be reflected at the regional scale. To overcome these issues, forecast climate change data has been used from UKCP18. This has been	Assessments made in relation to 'consequence' and 'likelihood' rely on professional judgement and evidence gathered through other environmental disciplines. All assumptions and limitations, including any exclusions, together with assumptions for choices

[23] Department for Transport (2019); National Travel Survey England. Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/906276/national-travel-survey-2019.pdf

[24] Multiple Contributors: 'Guidance on measuring and reporting Greenhouse Gas (GHG) emissions from freight transport operations'.

Assumption / Limitation	Consequence	Resolution
	coupled with the replication of proven effective approaches undertaken for similar project types.	and criteria leading to exclusion of input and output data have been documented as part of the assessment.
Some data is not available to provide a quantified assessment of the GHG emissions from the construction and operation of the proposed development.	Where particular information was not able to be specified at this stage, assumptions and omissions have been clearly stated.	The GHG assessment presented here is therefore a mix of quantitative and qualitative, according to data availability.

The vulnerability of the Proposed Development to climate change

18.72 The vulnerability of the Proposed Development to climate change considers the impacts of a changing climate and extreme weather events on numerous receptors associated with the Proposed Development.

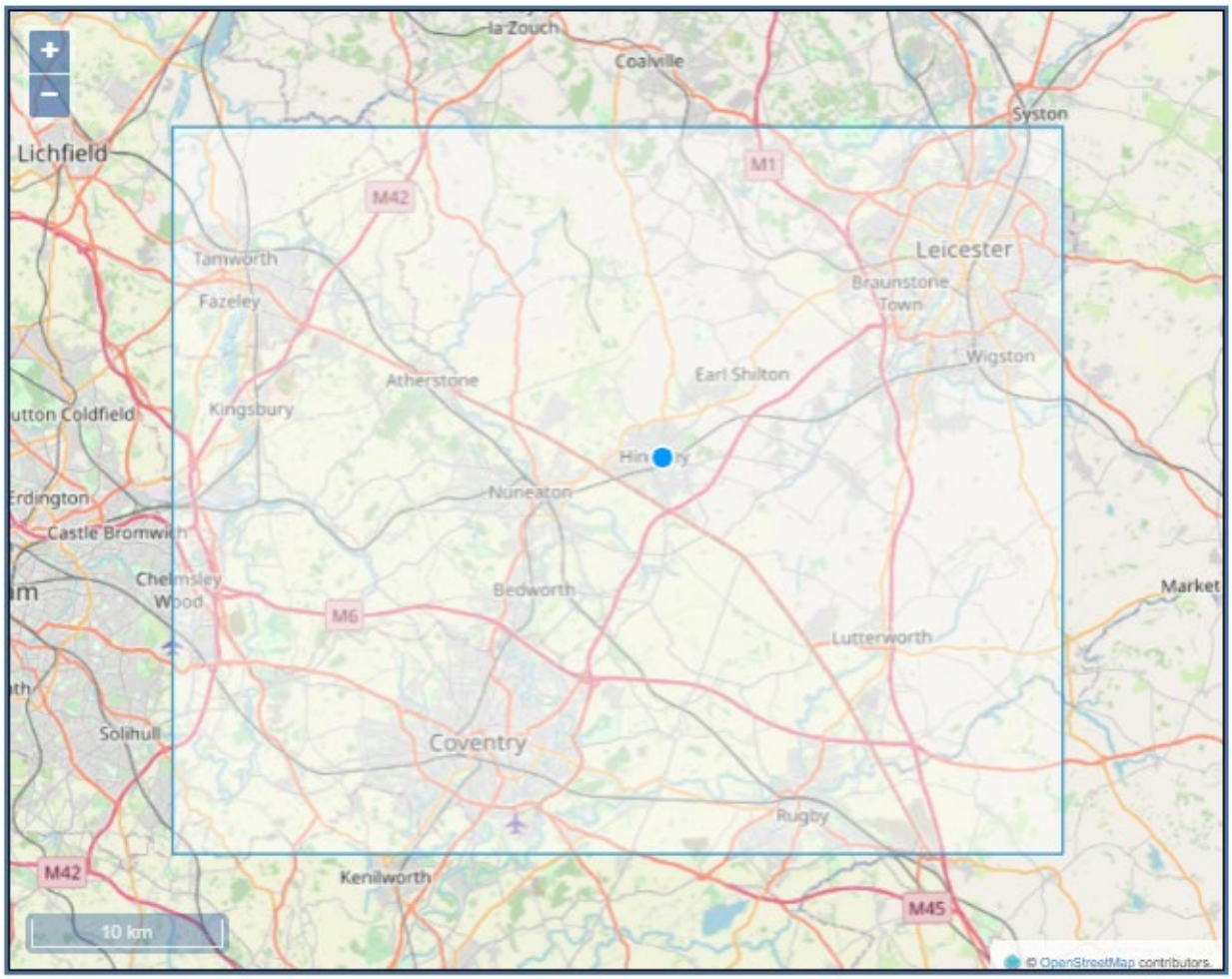
18.73 The Study Area considered for the assessment of vulnerability of the Proposed Development to climate change consists of the infrastructure within the HNRFI Site, looking at changes over the planned lifetime of the 60 years from commissioning. Information on climate trends and projections at the national and local scale (where available) will also be utilised. Climate trends and projections are published by the Met Office through the United Kingdom Climate Projections (UKCP) website and provide the most up to date assessment of how the climate of the UK may change over this century.

18.74 The climate vulnerability assessment has used Met Office published historical regional weather data to establish the current climate impacts on the Study Area for which the UKCP probabilistic projections are based.

18.75 The projections that are used to define the future baseline against which resilience of the Proposed Development is assessed are 'UKCP18' projections for the 2080s for the 25 km^2 UKCP18 grid square (northern extent: 311012.50, southern extent: 273212.50, eastern extent: 463850.00, western extent: 417450.00) for a high emissions scenario ('Representative Concentration Pathway (RCP[25]) 8.5') which encompasses the Proposed Development (Figure 18.1).

[25] A Representative Concentration Pathway (RCP) is a greenhouse gas concentration (not emissions) trajectory adopted by the IPCC.

Figure 18.1: Study Area (vulnerability to climate change)



The influence of the Proposed Development on climate change

18.76 The GHG emissions assessment is not restricted by geographical area but instead includes any increase or decrease in emissions as a result of the Proposed Development. The Study Area is therefore comprised of 'direct'[26] and 'indirect'[27] emissions sources:

- Primary sources:
    - emissions relating to on-site construction activities (such as plant use on-site);
    - operational emissions from site maintenance activities related to replacement (such as plant use on-site); and
    - operational end user traffic – a comparison has been made between GHG emissions between the Do-minimum (without the Scheme) and Do-something

[26] Direct GHG emissions are emissions from sources that are owned or controlled by the reporting entity.
[27] Indirect GHG emissions are emissions that are a consequence of the activities of the reporting entity but occur at sources owned or controlled by another entity.

(with the Scheme) scenarios provided by a GHG assessment based on data from the traffic model and Transport Analysis Guidance (TAG): Unit A3 Environmental Impact Appraisal.

- Secondary sources:
    - construction emissions relating to the manufacturing, transport and disposal of materials, which may be some distance from the location of the Proposed Development (for example, emissions associated with the manufacture of cement and steel); and
    - operational emissions from the manufacturing, transport and disposal of repair and refurbishment materials, which may be some distance from the location of the Proposed Development (for example, emissions associated with the manufacture of cement and steel).

Baseline data collection

18.77 The baseline data collected and presented in this chapter were sourced through desktop research.

18.78 The UK Meteorological Office ('Met Office') provides historical regional climatic data for Leicestershire, England. This report illustrates the typical local weather in Hinckley, based on statistical analysis of historical hourly weather reports weather stations in proximity to Hinckley to estimate temperature, rainfall and dew point.

18.79 The local, regional, national and global environment within which GHG emissions are emitted is considered the sensitive receptor within the assessment.

18.80 To model and predict future climate it is necessary to make assumptions about the economic, social and physical changes to our environment that will influence climate change. RCPs are a method for capturing those assumptions within a set of scenarios. RCPs specify the concentration of GHG in the atmosphere which will result in target amounts of radiative forcing at the top of the atmosphere by 2100, relative to pre-industrial levels. Four RCPs are modelled in UKCP18 (RCP2.6, RCP4.5, RCP6.0 and RCP8.5), representing four different climate outcomes; RCP8.5 is the highest emissions scenario and was applied to identify the 'worst case' scenario with respect to climatological trends.

18.81 In combination, climate change and extreme weather events will bring challenges for the UK's infrastructure over time, including in the short- (2020s), medium- (2050s) and long-term (2080s). The design life of the Proposed Development as detailed in Chapter 3: *Project Description* has been used to identify the temporal boundary for the climate vulnerability assessment. UKCP18 data does not extend beyond the 2080s timescales. In light of the above, the assessment presented here considers the 2080s timescales under RCP8.5.

18.82 The projections provided by UKCP18 are probabilistic, which means that rather than a single 'best-guess' of the impact of climate change they provide a range of outcomes

based on an 'ensemble' of multiple climate model runs. This better represents the uncertainty of climate prediction science. To help demonstrate consideration of uncertainty inherent within climate modelling, projections for the 10th, 50th (central) and 90th percentiles are stated, where possible. The 10th percentile describes the value at which 10% of the model runs fall at or below; the 50th percentile is the value at which half the climate scenarios fall below the figure and half fall above it; and the 90th percentile described the value at which 90% of the model runs fall at or below. Projections presented herein utilise the 50th percentile.

18.83 The Proposed Development is not in a coastal or estuarine location and is not at risk of tidal flooding. Other variables associated with sea level rise do not require further inclusion in this Chapter but are included in Chapter 15: *Hydrogeology* of this ES.

18.84 Data included in this Chapter has been collected from the following sources:

- UK Climate Projections (2018) (UKCP18)[28] – UK climate change projections used to define the future baseline against which vulnerability of the Proposed Development to climate change is assessed.
- UK Climate Projections (2009) (UKCP09)[29] –previous UK climate projections used where data from UKCP18 is unavailable.
- Centre for Environmental Data Analysis (CEDA)[30] – for observed climate data.
- Met Office regional climate profile for the English Midlands – for observed climate data.
- UK Local and regional CO_2 emissions – data tables[31].
- Assessments offered in respect of, Chapter 9: *Air Quality*, Chapter 12: *Ecology and Biodiversity*, and Chapter 14: *Surface Water and Flood Risk* that accompanies the application have all been utilised to better understand the vulnerability of the Proposed Development to climate change.
- The Proposed Development traffic model (Chapter 8: *Transport and Traffic*) has been used to calculate total construction and operational phase GHG emissions.

18.85 Taken together, it is considered that the data sources in combination with other topical assessments that form the application provide a robust indication of the prevailing baseline situation relevant to the assessment reported within this Chapter.

[28] Met Office (2019) UK Climate Projections User Interface. Available at: http://ukclimateprojections-ui.metoffice.gov.uk
[29] Met Office (2009) UK Climate Projections User Interface. Available at: http://ukclimateprojections-ui.metoffice.gov.uk
[30] Centre for Environmental Data Analysis (CEDA) (2019). Available at: http://www.ceda.ac.uk/
[31] Department for Business, Energy & Industrial Strategy (2018), 2005 to 2016 UK Local and regional CO2 emissions – data tables

18.86 IEMA's 'Climate Change Resilience & Adaptation' guidance[32] for making a development resilient to, and adaptable against, climate change stresses that climate change should be an integrated consideration within the EIA. This includes, for example, in the review of alternatives and the project design, how baseline environmental conditions may change with a changing climate and the resilience of mitigation measures to climate change. It should be informed by an understanding of future climate change scenarios and of the potential range of effects associated with these projections. By its very nature, climate change spans a range of topics and therefore elements of this topic are considered throughout this ES and other planning documents.

18.87 As the Proposed Development will only take 10 years to construct, the variability of the climate in the last 10 years has been taken into account when judging its vulnerability to climate change during the construction phase. This includes identifying recent extreme short-term weather events, as recommended by IEMA[28]. Therefore, this assessment will recommend climate change-related mitigation measures based on these recent conditions during the construction phase.

18.88 For the assessment of the vulnerability of the Proposed Development to climate change during the operational stage, the long-term impacts of climate change, as predicted in the UKCP18, will be used to judge its vulnerability. This accords with IEMA guidance. Climate change-related mitigation measures for the operational phase will be based on these long-term projections.

18.89 Table 18.8 lists the climate variables, including extreme weather events which have been considered in this assessment (indicated with a tick in the table). Blank cells indicate variables that have not been considered further in this assessment due to geography and/or the context of the Proposed Development. In Lieu of EU guidance, World Bank prescribed best practice; Australian guidance, 'Standards Australia Climate Change Adaptation for settlements and infrastructure – a risk-based approach'[33] has been applied in lieu of any UK and European guidance to assess the vulnerability of the elements of the Proposed Development, along with professional judgement.

[32] IEMA (2020) Environmental Impact Assessment Guide to Climate Change Resilience and Adaptation.
[33] AS 5334—2013.

Table 18.8: Climate variables and hazards

Components of the Proposed Development	Sea				Precipitation				Temperature			Wind		Relative Humidity		Water Quality and Soils			
	Sea level rise	Storm surge and tidal	Surface Temperature	Currents and Waves	Changes in seasonal average	Drought	Extreme precipitation events	Snow	Changes in seasonal average	Extreme temperature events (high and low)	Solar radiation	Gales and extreme wind events	Storm (lightening and hail)	Changes in annual average	Evaporation	Soil moisture	Salinity /pH	Runoff	Degradation of soils
Substructure					✓	✓	✓	✓	✓	✓						✓		✓	✓
Infrastructure / Building Structures					✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				✓	
Road					✓	✓	✓	✓	✓	✓	✓			✓	✓	✓		✓	✓
Bridges																			
Landscaping and Quarry Face					✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓		✓	✓
Pedestrian and Cycle Ways					✓	✓	✓	✓	✓	✓	✓			✓	✓	✓		✓	✓
Rail Infrastructure					✓	✓	✓	✓	✓	✓		✓	✓	✓				✓	✓

18.90 The climate vulnerability assessment focusses on identifying the impacts and effects of climate change, including extreme weather events, on receptors. It follows IEMA's best practice procedures. The steps involved within this criteria, as well as the specific actions that are likely to be required at each step of the process are included as Appendix 18.1.

Identifying sensitive receptors

18.91 The following receptors, identified in other ES topic chapters and other supporting documents, are considered potentially sensitive to climate change:

- Chapter 8: *Transport and traffic*: An increase in extreme events (flooding, high winds and high temperatures) can cause traffic disruption;
- Chapter 10: *Noise and vibration*: Higher temperatures can alter the behaviour of noise sensitive receptors which can increase their exposure to noise;
- Chapter 12: *Ecology and biodiversity*: Receptors that are likely to experience impacts are changes in habitats (seasonality and resilience), birds (in terms of future assemblage, seasonality breeding and feeding) and bats (in terms of seasonality and feeding);
- Chapter 14: *Surface water and flood risk*: Recommended 'Contingency Allowances' for Climate Change are guided by the Environment Agency. Considerations include fluvial flooding, groundwater, surface water runoff generation and overland flow, including flood risk receptors (people, property and infrastructure that may be at risk from any flooding, including the Proposed Development, any off-site properties and existing sewers); and
- Chapter 16: *Geology, soils and contaminated land*: Continuing declines in soil moisture and changes in season temperatures can increase the need for irrigation and increases stress upon foundations, effecting the stability of structures. Other impacts include erosion and stability of rock formations, which can be accelerated by extreme climate events, such as intense rain, drought, heat waves and storms.

18.92 The assessment of the magnitude of effects takes into account factors including:

- the acceptability of any disruption in use if the project fails;
- its capital value if it had to be replaced;
- its impact on neighbours;
- the vulnerability of the project element or receptor; and
- if there are dependencies within any interconnected network of nationally important assets on the Proposed Development.

Assumptions and limitations

18.93 The assumptions and limitations which apply to this assessment are outlined in Table 18.9. For each assumption or limitation, an explanation of the possible effect of the assumption has been provided as well as a description of any corrective actions that have been taken to adjust for any limitations. These assumptions are considered reasonable and are not likely to impact on the outcome of the assessment.

18.94 At the point of submission of the PEIR modelling data has been produced for the operational scenario only. Construction phasing is yet to be defined in detail in relation to likely traffic movements. However, operational traffic levels, being permanent, long term and connected with distribution represents the worst-case impacts as these will be operational on 24 hour seven days per week basis. Construction phase impacts will be assessed in the ES accompanying the DCO application, but material excavation and removal from the HNRFI Site is not predicted at this stage, therefore significant savings in off-site construction traffic is likely. .

Table 18.9: Climate vulnerability assessment assumptions and limitations

Assumption / Limitation	Consequence	Resolution
The assessment undertaken provides a broad indication of the potential impacts of climate change on the Proposed Development.	The assessment is based on a qualitative assessment and professional judgement.	An approach has been developed and applied in this assessment based on existing best practice.
There is currently no agreed methodology that should be applied for assessing the vulnerability of major schemes, including road infrastructure, under the EIA regulations.	The assessment has not been undertaken in line with specific standards.	An approach has been developed and applied in this assessment based on existing best practice guidance.
The UKCP18 projections have been used to infer future changes in a range of climate variables that may affect the vulnerability of the Proposed Development to climate change. At the time of writing, these represent the most up-to-date representation of future climate in the UK.	The UKCP18 data currently available does not provide data from extreme precipitation, drought, snow and ice, extreme temperature, solar radiation, wind or relative humidity. Data for these aspects has been taken from UKCP09. There are inherent uncertainties associated with climate projections and they are not predictions of the	A 'high' emissions scenario (Representative Concentration Pathways (RCP) 8.5) using the 2080s timeslice (2070- 2099 – the longest temporal scale available through UKCP18) has been used to develop the baseline against which resilience has been assessed. This is consistent with the precautionary principle (i.e. 'worst case'

Assumption / Limitation	Consequence	Resolution
	future. It is possible that future climate will differ from the baseline climate against which the resilience of the Proposed Development has been assessed depending on global emissions over the next century.	scenario).
Analysis of climate projections is based on selected observational data.	The results of climate model ensembles and a selected range of existing climate change research and literature available at the time of assessment.	Any future decision-making based on this analysis should consider the range of literature, evidence and research available at that time and any changes to this.
The determination of resilience has been undertaken under the assumption that industry design standards will be adhered to where detailed information is unavailable.	Industry design standards may not have been updated to account for climate resilience.	To be applied, as applicable, as the design, construction and operation of the Proposed Development develops.

Determining the significance of effect

Vulnerability and sensitivity of receptors

18.95 The assessment should not only identify the Proposed Developments potentially sensitive receptors to climate change, but also determine each receptors sensitivity to these changes. The sensitivity of the receptor/receiving environment is the degree of response of a receiver to a change and a function of its capacity to accommodate and recover from a change if it is affected. Identifying the sensitivity of receptors can be achieved by determining each receptors susceptibility and vulnerability to climate change.

18.96 A receptors susceptibility is its ability to be affected by a change. In this sense, it is the opposite of resilience. Determining the susceptibility of the receptor can be done using the scale in Table 18.10.

Table 18.10: Criteria for determining a receptor's susceptibility to climate change

Susceptibility Category	Description (probability and frequency of occurrence)
High susceptibility	Receptor has no ability to withstand/not be substantially altered by the projected changes to the existing/prevailing climatic factors (e.g. lose much of its original function and form).
Moderate susceptibility	Receptor has some limited ability to withstand/not be altered by the projected changes to the existing/prevailing climatic conditions (e.g. retain elements of its original function and form).
Low susceptibility	Receptor has the ability to withstand/not be altered much by the projected changes to the existing/prevailing climatic factors (e.g. retain much of its original function and form).

18.97 A receptors vulnerability is a measure of its potential exposure to the changing climate. It be defined using a scale set out in Table 18.11.

Table 18.11: Criteria for determining a receptor's vulnerability to climate change

Vulnerability Category	Description (probability and frequency of occurrence)
High vulnerability	Receptor is directly dependent on existing/prevailing climatic factors and reliant on these specific existing climate conditions continuing in future (e.g. river flows and groundwater level) or only able to tolerate a very limited variation in climate conditions.
Moderate vulnerability	Receptor is dependent on some climatic factors but able to tolerate a range of conditions (e.g. a species which has a wide geographic range across the entire UK but is not found in southern Spain).
Low vulnerability	Climatic factors have little influence on the receptors (consider whether it is justifiable to assess such receptors further within the context of EIA – i.e. it is likely that such issues should have been excluded through the EIA scoping process).

18.98 Assessing the significance of potential effects on the Proposed Development will apply a risk-based methodology for identifying potential climate impacts and assessing their severity (IEMA 2020) and can be summarised into the following steps:

- identifying potential climate change risks to a scheme or project;
- assessing these risks (potentially prioritising to identify the most severe); and
- formulating mitigation actions to reduce the impact of the identified risks.

18.99 Any assessment of risk to the Proposed Development includes assessing the likelihood

(or probability) and magnitude (or severity) of the impacts identified. The likelihood of an event and the severity (or 'magnitude') of the event have been qualitatively assessed using the descriptions in Table 18.12 and Table 18.13 respectively, based on professional judgement and emerging best practice (IEMA, 2020[28]). The significance of the effects of climate change on receptors is determined by combining the likelihood and consequence ratings, as shown in Table 18.14.

Table 18.12: Criteria for likelihood categories

Likelihood Category	Description (probability and frequency of occurrence)
High	The event occurs several times during the lifetime of the project (60 years), e.g. approximately once every five years, typically 12 events. 90-100% probability that the hazard will occur
Medium	The event occurs limited times during the lifetime of the project (60 years), e.g. approximately once every 15 years, typically 4 events. 66-90% probability that the hazard will occur.
Low	The event occurs during the lifetime of the project (60 years), e.g. once in 60 years. 33-66% probability that the hazard will occur
Very Low	The event may occur once during the lifetime of the project (60 years). 0-33% probability that the hazard will occur.

18.100 Assessment of the magnitude of impacts will take into account factors including:

- the acceptability of any disruption in use if the project fails;
- its capital value if it had to be replaced;
- its impact on neighbours;
- and the susceptibility of the project element or receptor; and
- if there are dependencies within any interconnected network of nationally important assets on the Proposed Development.

Table 18.13: Criteria for magnitude of change

Consequence of Impact	Description
Very Large Adverse	Permanent damage to structures/assets; Complete loss of operation/service; Complete/partial renewal of infrastructure; Serious health effects, possible loss of life; Extreme financial impact; and Exceptional environmental damage

Consequence of Impact	Description
Large Adverse	Extensive infrastructure damage and complete loss of service; Some infrastructure renewal; Major health impacts; Major financial loss; and Considerable environmental impacts.
Moderate Adverse	Partial infrastructure damage and some loss of service; Moderate financial impact; Adverse effects on health; and Adverse impact on the environment.
Minor Adverse	Localised infrastructure disruption and minor loss of service; No permanent damage, minor restoration work required; and Small financial losses and/or slight adverse health or environmental effects.
Negligible	No damage to infrastructure; No impacts on health or the environment; and No adverse financial impact.

Table 18.14: Matrix for significance

Measure of Consequence	Measure of Likelihood				
	Very Low	**Low**	**Medium**	**High**	**Very High**
Negligible	Not significant	Not significant	Not significant	Not significant	Not significant
Minor	Not significant	Not significant	Not significant	Significant	Significant
Moderate	Not significant	Not significant	Significant	Significant	Significant
Large	Not significant	Significant	Significant	Significant	Significant
Very Large	Not Significant	Significant	Significant	Significant	Significant

18.101 The above approach has been used to assess the likely significant environmental effects for each phase of the Proposed Development. These phases include:

- The works (i.e. the Main HNRFI Site preparation, demolition and construction works required to facilitate the Proposed Development); and
- the completed and operational Proposed Development.

18.102 The following terms have been used to define the significance of the effects identified:

- minor: slight, very short or highly localised effect;

- moderate: limited effect (by extent, duration or magnitude) which may be considered significant;
- large: considerable effect (by extent, duration or magnitude) of more than local significance or in breach of recognised acceptability or standards; and
- very large: potentially catastrophic effect (by extent, duration or magnitude) of more than local significance which results in permanent damage/loss of life and/or environmental conditions.

18.103 Significant effects are classified as either beneficial or adverse based on a standard set of criteria defined as follows:

- beneficial: an advantageous effect on the defined study area; and
- adverse: detrimental effects on the defined study area.

18.104 In accordance with best practice, short-term effects are Temporary effects related to a specific construction event of no more than a year's duration – such as the construction of an individual building or a specific element of infrastructure such as a section of road. Medium-term effects are considered temporary effects of longer duration, such as those arising over an extended period of construction ranging from one year to the full construction period, envisaged to be ten years. Long-term effects are those permanent effects arising from the operation of the HNRFI or from the permanent presence or removal of physical features.

RELEVANT BASELINE CONDITIONS

GHG emissions

National emissions

18.105 In 2019, net territorial emissions in the UK of the basket of seven greenhouse gases covered by the Kyoto Protocol were estimated to be 454.8 million tonnes carbon dioxide (CO_2) equivalent (MtCO2e), a decrease of 2.8% compared to the 2018 figure of 468.1 million tonnes and 43.8% lower than they were in 1990. Carbon dioxide made up around 80% of the 2019 total[34].

18.106 The transport sector consists of emissions from road transport, railways, domestic aviation, shipping, fishing and aircraft support vehicles. It is estimated to have been responsible for around 27% of greenhouse gas emissions in the UK in 2019, almost entirely through carbon dioxide emissions. The main source of emissions from this sector is the use of petrol and diesel in road transport. Transport emissions fell by 2% between 2018 and 2019, despite an increase in road traffic. Between 1990 and 2019,

[34] Department for Business, Energy and Industrial Strategy (February 2021): 2019 UK Greenhouse Gas Emissions, Final Figures.

there has been relatively little overall change in the level of greenhouse gas emissions from the transport sector.

Local, regional and national emissions comparison

18.107 A summary of regional GHG emissions (2018) for Hinckley, the Midlands and Nationally is included as Appendix 18.2. Information was procured from the Department for Business, Energy and Industrial Strategy[35]

Network emissions

Road

18.108 The baseline conditions from within the Main HNRFI Site are expected to be very low given current land uses and limited human and natural activity including energy consumption (fuel, power), industrial processes as outlined in Chapter 3. Due to the Main HNRFI Site currently comprising agricultural fields, no construction works are anticipated to take place in the 'do minimum' scenario, and as such no construction emissions are included within the baseline.

18.109 Under the Baseline (2019) scenario, total Carbon Dioxide (CO_2) vehicular emissions from the modelled transport network, without the development, have been estimated to result in 4,066 kilo tonnes of carbon dioxide equivalent ($ktCO_2e$) a year as presented in Table 18.15.

Table 18.15: Total GHG emissions for all traffic in the traffic model area

Total LDV ($ktCO_2e/yr$)	Total HGV ($ktCO_2e/yr$)	Total Vehicles	Total $ktCO_2e/yr$
1,100	2,967	20,211,767	4,066

Rail

18.110 The total volume of rail freight moved dropped to 16.6 billion net tonne kilometres in the financial year 2019-20, its lowest total in 23 years[36]. In 2018, 8.9% of freight moved in Great Britain was by trains, a 0.2 percentage point decrease compared with the previous year. In 2019/20, the total amount of rail freight transported decreased to 16.6 billion net tonne kilometres, a 4.6% decrease from 2018/19[37]. Trends demonstrate this decrease could account for the decline in consumption, and therefore demand, of coal as non-coal related freight has on balance increased since

[35] https://www.gov.uk/government/statistics/uk-local-authority-and-regional-carbon-dioxide-emissions-national-statistics-2005-to-2018
[36] Q4 freight statistics have been affected by the Coronavirus (Covid19) pandemic, although the impact is small given the number of days affected up to the end of March 2020 (Office of National Statistics, Freight Rail Usage and Performance 2019-20 Q4 Statistical Release).
[37] Department for Transport (December 2020): Rail Factsheet.

2009. Domestic Intermodal (which includes retail stocks transported by rail) retains the largest share in 2019-20, with a 41% share (6.77 billion net tonne kilometres). The second largest, Construction, rose by 3% in 2019-20 taking it to its largest total (4.64 billion net tonne kilometres) since the time series began in 1998-99.

18.111 Under normal operating circumstances[38], the adjacent rail network accommodates a total of 79 train movements per day. Of this, 37 (46%) are considered rail freight[39].

18.112 The amount of diesel consumed by freight trains in 2019-20 has increased by 12.5% to 172 million litres. This is the highest figure since 2015-16, and the first time that diesel use increased year on year since 2015-16. Electricity usage fell by 6.3% to 70 million kWh. The resulting CO2e emissions for freight trains have increased to 27.5g CO2e per tonne km. This is the highest level since the comparable time series started in 2011-12.[40]

18.113 The average GHG of singular freight journey is estimated to be approximately 19 metric tonnes of CO_2e. The adjacent network is therefore estimated to be responsible for 255 $ktCO_2e$ a year from freight travel alone[41].

Current climatic conditions

18.114 The Midlands lie at the geographic heart of England. As such, it has a climate that is essentially transitional between northern and southern England regarding temperature and between Wales and eastern England regarding rainfall.

18.115 In Hinckley, the summers are short, comfortable, and partly cloudy and the winter conditions are considered cold, windy, and mostly cloudy. Over the course of the year, the temperature typically varies from 2°C to 21°C and is rarely below -4°C or above 26°C.

Temperature

18.116 Between 1981-2010, the mean maximum temperature in the Midlands ranged from 6.7°C (January) to 21.1°C (July), whilst the mean minimum temperature ranged from 0.8°C (February) to 11.5°C (July). Over the same period, the annual maximum temperature was 13.4°C, whilst the annual minimum temperature stood at 5.6°C. There were, on average, approximately 11 days of frost for each of December, January and February between 1981 – 2010, whereas this average didn't exceed 0.1 days of frost between June and September.

18.117 Mean maximum and minimum temperatures recorded at Coleshill weather station,

[38] Pre-COVID-19

[39] Realtime Trains (2021): Hinckley Rail Station. The baseline operations on the rail network have been reviewed for the NRFI operations and data has been taken from the Realtime train website to provide a baseline condition for the purposes of this PEIR chapter.

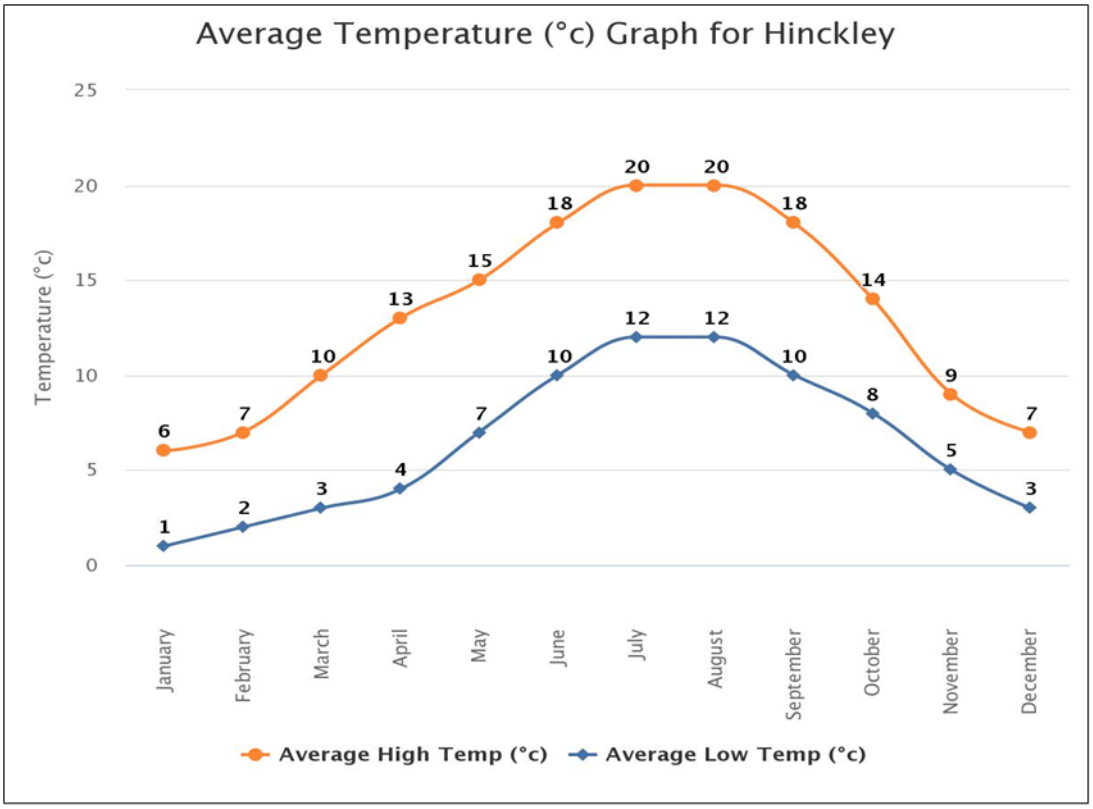
[40] Office of Rail and Road (5 November 2020): Rail Emissions 2019-20

[41] Average link length is estimated at 150 miles / 238 km. Average weight of the rail freight asset is estimated at 3,000 tonnes.

the closest Met Office weather station to the Proposed Development, between 1981 – 2010 were generally slightly higher than those recorded for the English Midlands. Meanwhile, the average number of days of frost over both winter and summer months were very similar to those in the Midlands.

18.118 Figure 18.2 shows the average high and low monthly temperatures in °C in Hinckley between 2009 - 2021.

Figure 18.2: Average high and low monthly temperatures in Hinckley between 2009 - 2021.



Source: World Weather Online

Precipitation

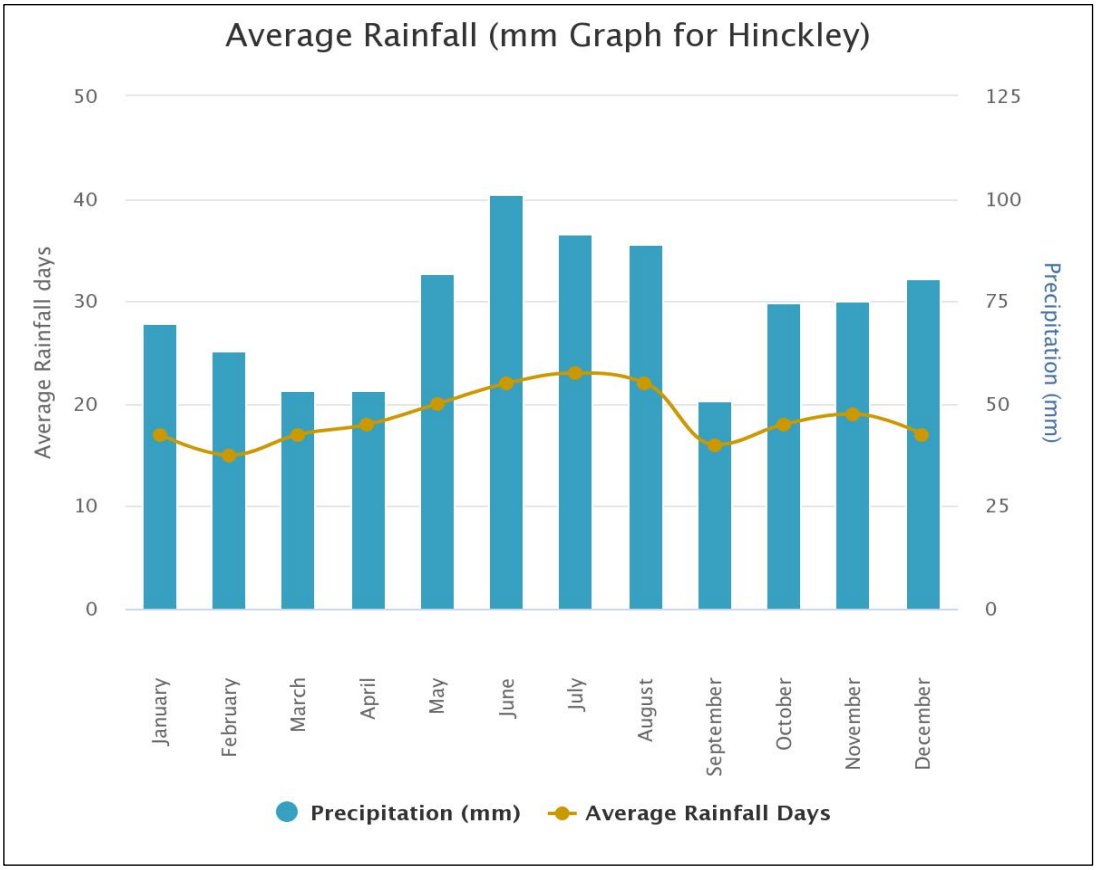
18.119 According to the Met Office, the mean annual rainfall in the Midlands between 1981 – 2010 was 798.3mm. The months with the highest rainfall were October – January (74 – 82mm). These months also had the highest average number of days where rainfall exceeded 1mm. February – May (54 – 59.1mm) provided the least amount of mean annual rainfall, whilst the lowest average number of days where rainfall exceeded 1mm occurred between June – September.

18.120 According to the weather station at Coleshill, the mean annual rainfall between 1981 – 2010 was 712.4mm. As with the Midlands, rainfall was most plentiful between October – January (63.9 – 73.1mm). However, August (67.8mm) also produced a lot of rainfall. Excluding February (10), the months which produced the highest number

of rainy days were October – March (11.5 – 12.7). Similar to the Midlands, the lowest average amount of rainfall occurred between February – May (43.8 – 53mm). However, an average of only 49mm of rainfall fell in July. June produced the fewest number of rainy days on average (8.6) over the same period with July (9.8) the next lowest.

18.121 Figure 18.3 shows the average monthly precipitation and average number of rainy days (those in which 1mm or more of precipitation falls) in Hinckley between 2009 - 2021.

Figure 18.3: Average monthly precipitation and average number of rainy days in Hinckley between 2009 - 2021.



Source: World Weather Online

Daylight

18.122 The number of hours of bright sunshine is controlled by the length of day and by cloudiness.

18.123 The mean number of sunshine hours in the Midlands between 1981 – 2010 was greatest between May – August (174.7 – 189.6 sunshine hours), whilst the least amount occurred between November – February (45 – 71.4). The average amount for the remaining months was recorded at between 99.4 – 133.2.

18.124 The length of the day in Hinckley varies extremely over the course of the year. In 2020, the shortest day was 22 December, with 7 hours, 38 minutes of daylight; the longest days were 20 and 21 June, with 16 hours, 50 minutes of daylight[42].

18.125 In terms of cloudiness in Hinckley, the clearer part of the year in Hinckley begins around 18 April and lasts for 5.7 months, ending around 10 October. On 15 July, the clearest day of the year, the sky is clear, mostly clear, or partly cloudy 56% of the time, and overcast or mostly cloudy 44% of the time. The cloudier part of the year begins around 10 October and lasts for 6.3 months, ending around 18 April. On 26 December, the cloudiest day of the year, the sky is overcast or mostly cloudy 75% of the time, and clear, mostly clear, or partly cloudy 25% of the time.

18.126 Although there were very slight variations between the mean number of sunshine hours for each month in the Midlands and the mean number recorded at Coleshill weather station, the amounts were very similar.

Wind

18.127 The average monthly windspeed in Hinckley does not vary greatly. Over the last 10 years (2011 – 2020), average monthly windspeeds have ranged between 7 – 12 miles per hour (mph). Average windspeeds are generally greater during winter months.

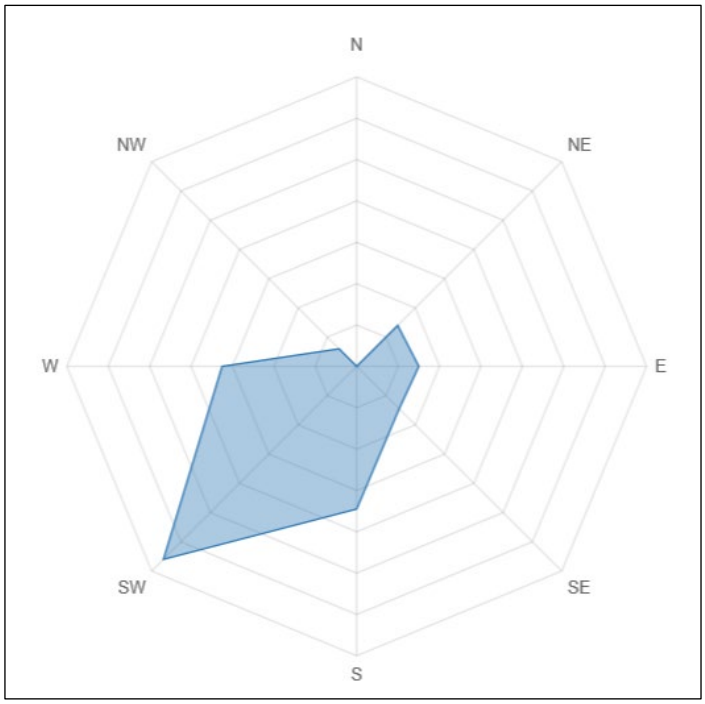
18.128 From 2010 - 2018, monthly maximum gusts of wind ranged from 20 – 54 mph with greater gusts generally occurring throughout winter months. However, June 2019 and July 2020 saw monthly maximum gusts of 100 and 91 mph, respectively. Monthly maximum gusts did not exceed 48 mph during the remainder of both years[43].

18.129 The predominant wind direction at Hinckley comes from a south-westerly direction. This is graphically illustrated by Figure 18.4, which shows the wind direction at Hinckley in 2020. On average, wind arrived from the south-west, west and south for the majority of the year.

[42] Timeanddate.com

[43] https://www.yourweather.co.uk/weather_Hinckley-Europe-United+Kingdom-Leicestershire--1-33662.html?d=historical

Figure 18.4: Average wind direction at Hinckley



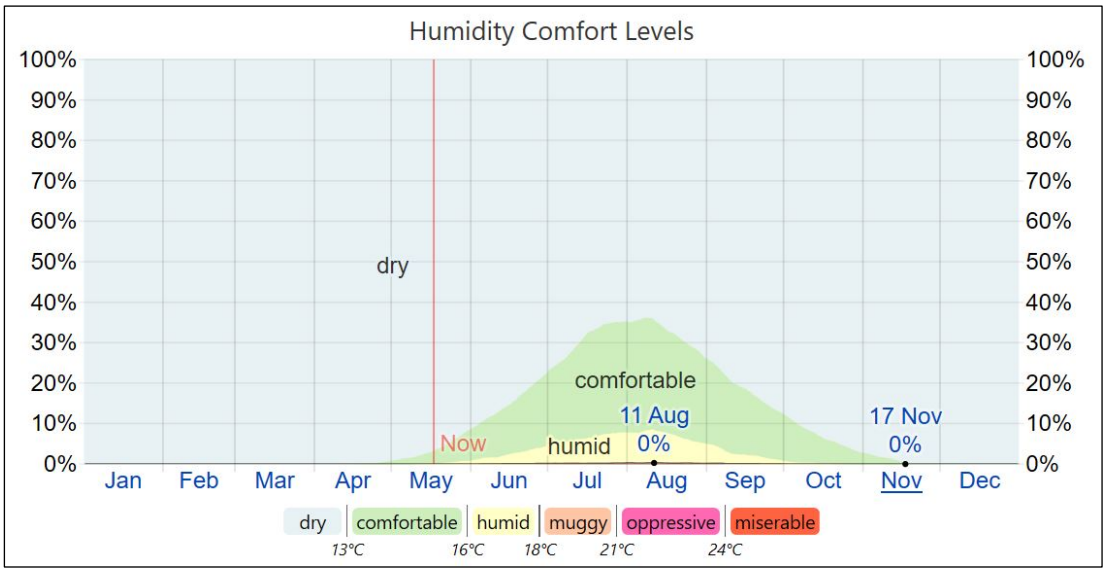
Source: meteostat.net (the wind rose is the interpolated results of an amalgamation of weather records from stations near Hinckley.

Humidity

18.130 The humidity comfort level is based on the dew point, as it determines whether perspiration will evaporate from the skin, thereby cooling the body. The perceived humidity level in Hinckley, as measured by the percentage of time in which the humidity comfort level is muggy, oppressive, or miserable, does not vary significantly over the course of the year, remaining a virtually constant 0% throughout[44]. Figure 18.5 illustrates the average monthly humidity comfort levels in Hinckley.

[44] https://weatherspark.com/y/41814/Average-Weather-in-Hinckley-United-Kingdom-Year-Round

Figure 18.5: Average monthly humidity comfort levels in Hinckley



Source: weatherspark.com

Future baseline

GHG emissions

18.131 The Intergovernmental Panel on Climate Change (IPCC) Special Report 'Global Warming of 1.5°C' (2018) is clear on the causes and the effects of climate change on the world. The report states that the primary driver of long term global warming is carbon dioxide (CO_2) emissions and that global temperatures relate to increased cumulative CO_2 emissions from human activity, primarily from energy use. This will result in significant loss of ecosystems and biodiversity along with increased impacts on human health and the economy. The world is already around 1°C warmer than preindustrial times and is currently on track to reach between 3- 4°C global temperature increase by 2100 if no action is taken. Action on climate change can deliver many local benefits, including lower energy bills, economic regeneration and the creation of local jobs, reductions in fuel poverty and improved air quality.

18.132 Under the 2036 Do Minimum scenario (opening year without the Proposed Development), GHG emissions are expected to decrease by 141 $ktCO_2e/yr$ across the network as shown in Table 18.16. This is as a result of a decrease in road traffic and vehicle efficiency increasing (including an increase in hybrid and all-electric vehicles).

Table 18.16: Baseline GHG emissions data for end user traffic in the region of the Proposed Development, 2036

Year	Total LDV ($ktCO_2e/yr$)	Total HGV ($ktCO_2e/yr$)	Total Vehicles	Total $ktCO_2e/yr$
2019	1,100	2,967	20,211,767	4,066

Year	Total LDV ($ktCO_2e/yr$)	Total HGV ($ktCO_2e/yr$)	Total Vehicles	Total $ktCO_2e/yr$
2036	996	2,929	19,769,761	3,925
Change	-104	-38	-442,006	-141

Climatic trends

18.133 With respect to temperature, UKCP18 suggests that the region will experience hotter summers and warmer winters, with more extreme temperature events (heatwaves).

18.134 Projections for the region in the 2080s under a high emissions scenario (RCP8.5) are as follows:

- Mean winter temperature is projected to increase by approximately 3°C (50th percentile).
- Mean summer temperature is projected to increase by approximately 5°C (50th percentile).
- Mean annual temperature is projected to increase by 3-4°C (50th percentile).

18.135 With respect to precipitation, UKCP18 suggest that the region will become wetter in winter and drier in summer, with more extreme rainfall events. This will cause increased drought conditions during summer months, a trend which will grow throughout the 21st Century, and increased risk of flooding during winter months.

18.136 Projections for the region in the 2080s under a high emissions scenario (RCP8.5) are as follows:

- Mean winter precipitation is projected to increase by up to 20% (50th percentile).
- Mean summer precipitation is projected to decrease by between 30-40% (50th percentile).
- Mean annual precipitation is projected to decrease by up to 20% (50th percentile).

18.137 UKCP18 projections show an increase in near surface wind speeds over the UK for the second half of the 21st century for the winter season when more significant impacts of wind are experienced. This is accompanied by an increase in frequency of winter storms.

18.138 The vulnerability of the Proposed Development to climate change depends on the level of exposure of the receptors to changes in different climate variables. In the short-term, natural vulnerability will dominate the weather-related risks that are experienced, including any extreme events (such as storms and heatwaves). Over the long term, the climate we experience will be influenced by levels of GHG emissions.

18.139 Sensitive receptors were identified through examination of the parameters plan and description of development (set-out in Chapter 3) for the Proposed Development and professional judgement. The sensitivity of each receptor was also determined through professional judgement, for which Table 18.17 details the outcomes.

Table 18.17: The sensitivity of identified receptors

Receptor	Susceptibility	Vulnerability	Sensitivity
Substructure	Low	Low	Low
Infrastructure / Building Structures	Moderate	Moderate	Moderate
Road	Moderate	Moderate	Moderate
Bridges	Low	Low	Low
Landscaping and Quarry Face	Low	Moderate	Moderate
Pedestrian and Cycle Ways	Moderate	Moderate	Moderate
Rail Infrastructure	Moderate	Moderate	Moderate

SIGNIFICANCE OF EFFECTS

Assessment of the Effects of the Proposed Development on the Climate (GHG Emissions)

Construction

18.140 The Proposed Development will have an impact on climate change due to carbon emissions during construction as well as operation. During the construction phase, there may be some emissions of CO_2 from construction traffic accessing the Main HNRFI Site, non-road mobile machinery and small generators temporarily used to power machinery and equipment on-site. It is not feasible to assess the carbon footprint of construction plant at this stage as machinery and detailed construction sequences and methodologies are not know. However, these emissions will be infrequent and temporary occurring between late 2019 and 2029 These are highly unlikely to make a significant contribution to the overall UK GHG emissions though they will lead to a net increase in carbon in the short term due.

18.141 The existing site consist of approximately 120 ha of low carbon vegetation. The loss of carbon stock would therefore be low. It is expected that there would be a net increase in carbon stock as a result of the landscaping, but this has not been quantified as the design has not been finalised at this stage. Although, there will be loss of existing carbon sink, it is assumed that proposed new planting will be sufficient to replace this.

18.142 . The greatest contribution to construction emissions is the embodied carbon within construction product. The embodied GHG emissions from material sources during construction have not been quantified for reasons set out in the methodology. In the absence of a detailed design, it is assumed that the prescription to BREEAM 'Very

Good' and Future Buildings standards will promote a focus on carbon reduction across all levels of the supply chain. The commitment by TSH to deliver net-zero buildings should not be underestimated and will result in a significant reduction in embodied carbon sources during construction. Therefore, opportunities for further reduction will be encouraged and captured through the incorporation of carbon targets within the procurement process. In light of the above, emissions associated with construction of the Proposed Development are not anticipated to materially affect the ability of the UK to achieve its carbon reduction targets, and thus are not predicted to have a significant effect on the global climate.

18.143 During construction, there will be GHG emissions resulting from vehicle use, such as on-site plant and delivery of materials. It is also expected that there will be emissions form the transport and disposal of construction waste. It has not been possible to quantify GHG emissions from worker commuting, waste trips and site plant as estimates of worker numbers, plant type and requirements and refuse trips are not yet available. HGV movements are expected to be 15% of the operational flows and are therefore not considered significant when compared with the worst case scenario (see Paragraph 18.149). An assessment of the effects of vehicular transport emissions during construction will be included in the final ES Chapter in support of the planning application. Due to the location, worker commuting is expected to be by private car which has higher GHG emissions than public transport. However, commuting distances are expected to be relatively short, which will continue to keep the resultant emissions low.

18.144 As the Proposed Development is progresses at detailed design any refinements to the design should be subject to environmental review to ensure that the residual effects would not be greater (or significantly different) than those reported in this ES

The completed and operational Proposed Development

Road emissions

18.145 GHG emissions result in the same global climate change effects wherever and whenever they occur and therefore the sensitivity of different human and natural receptors is not considered. The British Government intends to phase out new petrol and vehicles by 2030. Due to the resulting anticipated increase in uptake of electric vehicles over the design life of the Proposed Development, the end-user emissions calculated here are likely to be an overestimate. As projections for the uptake of electric vehicles are limited and uncertain, this has not been calculated as part of the end-user assessment.

18.146 Total end user GHG emissions are presented in Table 18.18 for the 'Do Something' (i.e. the first year of operation for the Proposed Development, assuming the 'worst case' that all development will be built-out) and the year 2036 (the future modelled year) and compared against the daily occupier increase for the Proposed Development whilst fully operational.

Table 18.18 Comparison of road user emissions for the Do-Minimum vs Do-Something scenarios

Scenario	Total LDV / $ktCO_2e$	Total HGV / $ktCO_2e$	Total Vehicles	Total $ktCO_2e$
Do Minimum	996	2,929	19,769,761	3,925
Do Something	1,012	3,270	20,259,835	4,282
Daily Occupier Increase *	**9**	**16**	**25,436**	**24**
**16,438 LDV and 8,998 HGV*				

18.147 The total regional traffic GHG emissions for the operational phase of the Proposed Development is 357 $ktCO_2e$ higher than the 'do minimum' scenario. However, the occupation of the Proposed Development accounts for less than 7% of the total increase.

18.148 In line with Paragraph 5.17 of the NPS for National Networks[45], and in the absence of agreed thresholds for what level of GHG emissions is considered significant in an EIA, professional judgement, based on schemes of a similar size and nature, has been used to assess the significance of effects:

- 4th UK carbon budget (2023 to 2027) = 1,950 MtCO2e (195,000 ktCO2e);
- 5th UK carbon budget (2028 to 2032) = 1,765 MtCO2e (176,500 ktCO2e); and
- 6th UK carbon budget (2033 to 2037) = 965 MtCO2e (96,500 ktCO2e).

18.149 As shown in Table 18.18 the impact of the Proposed Development against the UK's 6th National Carbon Budget is less than 1%.

18.150 The GHG emissions from the operation of the Proposed Development are likely to have an adverse impact. The magnitude of change in GHG emissions is considered to result in a permanent minor adverse effect.

Rail emissions

18.151 The direct effect of the additional rail movements (32- two-way per day) will result in an increase of approximately 221 $ktCO_2e$ per annum in the worst case (this assessment assumes both trips will include in fully laden trains). Though this represents an increase in GHG emissions, it should be noted that the average freight train can carry the same load as up to 77 Heavy Goods Vehicles (HGVs) meaning operating costs are much lower and CO_2 emissions for a shipment are reduced; tonne

[45] Department for Transport (2014) National Policy Statement for National Networks, December 2014.

for tonne, rail freight produces 70% less CO_2 than road freight[46]

18.152 In total, the Proposed Development will result in an approximate saving of 83 million HGV road miles per annum in comparison with non-rail connected developments. As a result, the switch from road to rail will save an addition of approximately 32 $ktCO_2e$ (5%) per annum.

18.153 The GHG emissions resultant from rail operations associated with the Proposed Development are likely to have an adverse impact. The magnitude of change in GHG emissions is considered to result in a permanent Minor adverse effect but will result in a betterment due to the rail savings.

Total GHG emissions

18.154 IEMA guidance suggests that all GHG emissions are significant in the absence of any significance criteria or defined threshold. However, given the embedded mitigation measures including electrical vehicle charging points, the magnitude of GHG emissions and the context of the Proposed Development, a national commitment to a significant reduction in the sale of new petrol and diesel vehicles post 2030 and in using professional judgement, it is considered that the minor adverse effect of the Proposed Development is not significant for the purpose of the assessment detailed in this ES. Furthermore, the GHG impacts of the Proposed Development would not have a material impact on the Government meeting its carbon reduction targets.

18.155 The combined (rail and road) GHG emissions for the operational phase of the Proposed Development is 578 $ktCO_2e$ higher than the 'do minimum' scenario. The occupation of the Proposed Development accounts for less than 1% UK's 6th National Carbon Budget.

18.156 The GHG emissions resultant from rail operations associated with the Proposed Development are likely to have an adverse impact. The magnitude of change in GHG emissions is considered to result in a permanent Minor adverse effect but will result in a betterment due to the rail savings.

18.157 As stated in the Department for Transport's National Policy Statement for National Networks , SRFIs are favoured in government policy for their ability to provide sustainable development through the reduction of transport-based GHG emissions by encouraging a modal shift of freight from road to rail. Furthermore, this modal shift will help to reduce traffic congestion and improve air quality in the wider East Midlands region.

18.158 The Framework Travel Plan (Appendix 8.2), which will be developed to support the application, recommends many mitigation measures which will help reduce GHG emissions associated with the transport of employees to and from the Main HNRFI

[46] Department for Transport (2016): Rail Freight Strategy

Site during the operational phase.

Energy Consumption

18.159 An Energy and Sustainability Report for the Proposed Development will be submitted in support of the application.

18.160 During operation there will be GHG emissions from energy consumption of on-site facilities – heating and lighting of all internal areas and catering energy use within the market place. GHG emissions arising from maintenance activities will come from both energy and materials use. In time, the assessment of operational GHG emissions will extend to energy use of on site facilities such as heating, cooling and lighting of internal areas.

18.161 In future, the built development could benefit from energy monitoring devices which would allow building managers to instantaneously view the energy requirements associated with maintaining appropriate internal conditions. It is anticipated that this will be linked to the incoming electricity and heat supply, and provide data upon which occupiers can better manage their specific needs.

18.162 No details on how reduction of unregulated emissions would be achieved are available at this stage. Unregulated energy includes small power electricity use (computers, plug in devices) and catering energy consumption. Currently, unregulated energy is not included within the current guidance due to the difficulty in accurately predicting the likely consumption. Whilst it is considered that unregulated energy could form a significant part of overall energy consumption and CO2 emissions it is considered negligible in the context of the Proposed Development as a whole.

18.163 The embedded design mitigation is considered best practice, with the aim of promoting an energy efficient and low carbon approach which minimises carbon usage now and in the future. On-site buildings will require energy for various activities such as electrical machinery and the heating and cooling of indoor areas. The Proposed Development will be designed to minimise this requirement for energy through the following measures:

- designing all buildings to at least a 'Very Good' BREEAM rating to ensure they are energy efficient;
- orienting the rooves of buildings towards the south-east and south-west as much as possible to maximise the use of solar radiation; and
- providing adequate space on each roof for installation of solar PV panels

18.164 There are also a number of potential measures that may be considered in the future which would further reduce GHG emissions. These may include:

- the use of CHP / on-site heat networks to improve the energy efficiency of the heating

of on-site units. If this is not possible, the use of air, and ground source heat pumps could be considered on-site to provide a similar role. Either of these options would help to improve the Proposed Developments BREEAM rating;

- the construction of a solar car port to allow the mass charging of EVs;
- heating will be provided principally using heat pumps or district heat from any site heat recovery or cogeneration plant. Provision will be made for a heat distribution network to serve the Main HNRFI Site;
- the installation of energy storage systems to store or sell surplus energy generated on-site;
- the on-site charging of electric HGVs if developed and used on-site. Consideration has been given to the potential doubling of site power capacity to meet charging loads for light goods vehicles, and future delivery of hydrogen fuelling infrastructure will be considered should it be the preferred approach;
- goods vehicles are likely to transition from diesel to electricity and hydrogen during the life of the Proposed Development. Any generation plant will be hydrogen-ready and fuelled initially by natural gas;
- a combined chill, and heat strategy may be employed to provide heating and hot water if units are to contain cold or chilled storage; and
- the energy capacity of the development will be augmented with on-site renewable generation from rooftop PV: All roofs to be PV ready, providing a potential installed capacity of 38MWp supplying over 25% of site power demand. Battery storage will provide additional power supply resilience and PV power timeshifting to optimise renewables deployment.

18.165 Although the charging of EVs on-site would increase the on-site electricity requirement, it would help to reduce GHG emissions.

Assessment of the vulnerability of the Proposed Development to climate change

18.166 The potential climate and weather-related impacts on the Proposed Development receptors during operation are included as Appendix 18.3. Unless stated, the effects identified are only expected to impact receptors located on the Main HNRFI Site.

18.167 The Proposed Development has been designed, as far as possible, to avoid and minimise impacts and effects relating to GHG and climate change through the process of design-development and by embedding mitigation measures into the design and the supporting Design and Access Statement and Sustainability Statement. Measures include those set-out in Paragraph 18.152 and include best practice design measures and mitigation associated with the conservation of ecological assets and flood risk protection. A number of standard mitigation measures have also been embedded that are considered standard practice, these include Building Energy Management System

(BEMS) to control the heating, lighting, ventilation, hot water supply and renewable energy interfaces in full accordance with CIBSE guidelines to control the use of and save energy. Prior to their implementation, the energy efficiency and sustainability measures will be assessed for suitability, technical review, installation costs, running costs, payback periods and plant space availability. The materials demand of the development will be addressed by maximising the use of reclaimed and recycled materials where practicable throughout the construction process. This will be considered in the early detailed design stages and written into the building specifications. The demand upon the development for the provision of recycling and waste storage will be addressed in the early detailed design stages and when detailed discussions can be held with prospective operators regarding the specific operations of the proposed units. In addition, recycling and waste will be considered for the construction phase. Provision has been made in the scheme for the inclusion of recycling and waste storage / compaction within the identified service areas.

18.168 Appendix 18.4 outlines the embedded mitigation measures that have been integrated into the design and construction methodology of the Proposed Development in order to improve the resilience of the Proposed Development to the potential impacts identified.

Assessment of the significance of climate change-related impacts on the Proposed Development

18.169 The significance of climate impacts depends on the likelihood of them occurring and the consequence if they do occur.

18.170 The following hazards were considered when assessing the significance of climate impacts:

- Winters are predicted to present warmer conditions, producing less snowfall but more rain which will increase the risk of flooding.
- Summers are predicted to exhibit warmer, drier conditions which will increase drought-like conditions and the likelihood of extreme hot temperature events.
- An increase in extreme weather events, including more very hot days, more intense downpours of rain and more drought-like conditions, is predicted.

18.171 Table 18.19 presents the outcome of the significance assessment (taking account of the embedded mitigation measures as described in Appendix 18.4). The effects relate to operation unless specifically stated.

18.172 With the mitigation measures described in Appendix 18.4, it is considered that climate change would have no significant impacts on the Proposed Development.

Table 18.19: Significance assessment for the vulnerability to climate change

Variable		Projected Change	Receptor	Effect	Consequence	Likelihood	Significance
Precipitation	Extreme rainfall events	Increase in magnitude and frequency of extreme rainfall events	Substructure/Built Structures. Roads, Pedestrian and Cycleways.	Damage to carriageway structures due to increased runoff	Minor adverse	Low	Not significant
				Soil saturation and water damage	Minor adverse	Low	Not Significant
				Increased slope instability	Moderate adverse	Low	Not Significant
				Damage to unpaved shoulders	Negligible	Low	Not Significant
				Erosion, silting and sedimentation	Negligible	Low	Not Significant
				Softening of subsurface materials below the carriageway and structures	Moderate adverse	Low	Not Significant
			Rail	Landslip and earthwork failure and risk to rolling stock and staff	Major adverse	Low	Not Significant
				Damage to railway embankment and slope	Major adverse	Low	Not Significant
				Scour of bridge supports	Major adverse	Low	Not Significant
				Water on track or in underground structures	Major adverse	Low	Not Significant
				Damage to rail track	Major adverse	Low	Not Significant

Variable		Projected Change	Receptor	Effect	Consequence	Likelihood	Significance
				Other material damage to equipment and infrastructures	Major adverse	Low	Not Significant
			Ancillary Equipment	Blockage of drains and associated assets	Minor adverse	Medium	Not Significant
				Water accumulation	Minor adverse	Low	Not Significant
			Employees and Users/Operators.	Difficult working conditions	Minor adverse	Medium	Not Significant
				Movement of debris causing slip, trip and fall hazards	Minor adverse	Medium	Not Significant
				Health and safety risks to road users (e.g. skidding)	Minor adverse	Medium	Not Significant
			Landscaping / Habitats	Changes in growing season and more vigorous growth during wet periods	Negligible	Medium	Not Significant
	Drought	Increased risk of drought	Substructure/Built Structures. Roads, Pedestrian and Cycleways.	Loss of vegetation leading to greater erosion risk	Negligible	Medium	Not Significant
				Deformation of rigid structures (roads, cycleway and footpath, culverts etc)	Moderate adverse	Low	Not Significant
				Enhanced reactions when cement stabilising and drying of concrete	Negligible	Medium	Not Significant

Variable		Projected Change	Receptor	Effect	Consequence	Likelihood	Significance
				Increased rate of deterioration of materials, potentially leading to need for early replacement	Negligible	Medium	Not Significant
				Drying out of construction materials and cracking	Minor adverse	Medium	Not Significant
				Increased dust and windborne materials affecting site construction, operation and maintenance, including silting and sedimentation	Minor adverse	Medium	Not Significant
			Rail	Failure of earthworks due to desiccation of embankments impacting rail track	Major adverse	Low	Not Significant
			Employees and Users/Operators.	More dust	Negligible	Medium	Not Significant
			Landscaping / Habitats	Drying out of construction materials and cracking	Minor adverse	Medium	Not Significant
	Change in seasonal average	Drier summers	Substructure/Built Structures. Roads, Pedestrian and Cycleways.	Subsidence	Moderate adverse	Low	Not Significant
				Failure of earthworks due to desiccation impacting carriageways.	Moderate adverse	Low	Not Significant

Variable		Projected Change	Receptor	Effect	Consequence	Likelihood	Significance
				Shrinking and cracking of soils	Moderate adverse	Low	Not Significant
				Enhanced reactions when cement stabilising and drying of concrete	Negligible	Medium	Not Significant
				Increased dust and windborne materials affecting site construction, operation and maintenance, including silting and sedimentation	Minor adverse	Medium	Not Significant
			Rail	Failure of earthworks due to desiccation of embankments impacting rail track	Major adverse	Low	Not Significant
	Change in seasonal average	Wetter winters (including flooding and/or repeated wet cycles)	Substructure/Built Structures. Roads, Pedestrian and Cycleways.	Damage due to increased runoff	Minor adverse	Low	Not Significant
				Soil softening and erosion leading to collapse and settlement of soil structures	Moderate adverse	Low	Not Significant
				Increased slope instability	Moderate adverse	Low	Not Significant
				Soil saturation	Minor adverse	Medium	Not Significant
				Damage to unpaved shoulders	Negligible	Low	Not Significant

Variable		Projected Change	Receptor	Effect	Consequence	Likelihood	Significance
			Rail	Closure of line due to track flooding	Major adverse	Low	Not Significant
				Failure of lineside equipment due to inundation of water	Major adverse	Low	Not Significant
				Access issues to depots, stations and offices	Major adverse	Low	Not Significant
				Scour of embankment material	Major adverse	Low	Not Significant
			Employees and Users/Operators.	Movement of debris causing slip, trip and fall hazards	Minor adverse	Medium	Not Significant
			Landscaping / Habitats	Changes in growing season and more vigorous growth during wet periods	Negligible	Medium	Not Significant
				Damage to unpaved shoulders	Minor adverse	Medium	Not Significant
		Increase in magnitude and frequency of extreme rainfall events	Employees and Users/Operators.	Water accumulation causing disruption to construction and operation	Minor adverse	Low	Not Significant
				Reduced opportunities for maintenance	Minor adverse	Medium	Not Significant

Variable		Projected Change	Receptor	Effect	Consequence	Likelihood	Significance
Temperature	Extreme temperature events	Increase in magnitude of extreme temperature	Substructure/Built Structures. Roads, Pedestrian and Cycleways.	Cracking and expansion particularly impacting structures / Thermal expansion and movement of joints and paved surfaces.	Moderate adverse	Low	Not Significant
				Increased risk of erosion	Minor adverse	Medium	Not Significant
				Deformation of pavement surfaces	Moderate adverse	Low	Not Significant
			Rail	Sag of overhead line (OHL) and risk of dewirement			
				Failure of temperature controls and overheating of electronic equipment	Major adverse	Low	Not Significant
				Warping of rail track	Major adverse	Low	Not Significant
				Overheating of safety device.	Major adverse	Low	Not Significant
				Derailment due to snow or ice causing brittle tracks and track separation	Major adverse	Low	Not Significant
				Loss of power to rolling stock due to ice and snow build up and contact failure	Major adverse	Low	Not Significant

Variable		Projected Change	Receptor	Effect	Consequence	Likelihood	Significance
				Icicle build up causing damage to pantograph	Major adverse	Low	Not Significant
				Ice on roads and vehicle incursion onto track system at level crossings	Major adverse	Low	Not Significant
				Frost cracking, freezing of equipment and structures on track	Major adverse	Low	Not Significant
				Supply cable sag or tensional failure	Major adverse	Low	Not Significant
				Damage to rail track	Major adverse	Low	Not Significant
				Other material damage to equipment and infrastructures			
			Landscaping / Habitats	Drying out and loss of vegetation	Negligible	Medium	Not Significant
				Fire	Moderate adverse	Low	Not Significant
			Ancillary Equipment	Overheating of equipment, including during construction and operation (e.g. electronic signage)	Minor adverse	Low	Not Significant
			Site Contents and Business Continuity	Reduced opportunities for maintenance	Minor adverse	Medium	Not Significant

Variable		Projected Change	Receptor	Effect	Consequence	Likelihood	Significance
			Employees and Users/Operators.	Difficult working conditions	Minor adverse	Medium	Not Significant
				Increased fire risk	Moderate adverse	Low	Not Significant
				Hot surfaces may cause injury	Minor adverse	Low	Not Significant
				Failure of temperature controls	Minor adverse	Low	Not Significant
	Change in seasonal average temperature	Hotter summers	Landscaping / Habitats	Drying out and loss of vegetation	Negligible	Medium	Not Significant
			Ancillary Equipment	Overheating of equipment, including during construction and operation (e.g. electronic signage)	Minor adverse	Low	Not Significant
			Substructure/Built Structures.	Enhanced reactions when cement is stabilising and drying of concrete	Negligible	Medium	Not Significant
			Employees and Users/Operators.	Reduced opportunities for maintenance	Minor adverse	Medium	Not Significant
				Greater demand for cooling	Negligible	Medium	Not Significant
				Difficult working conditions	Minor adverse	Medium	Not Significant
				Fire risk	Moderate adverse	Very low	Not Significant
			Rail	Warping of rail track	Moderate adverse	Very low	Not Significant

Variable		Projected Change	Receptor	Effect	Consequence	Likelihood	Significance
	Change in seasonal average temperature	Warmer winters	Landscaping / Habitats	Changes in growing season and more vigorous growth during autumn and winter	Negligible	Medium	Not Significant
				Changes in invasive species	Negligible	Medium	Not Significant
			Roads, Pedestrian and Cycleways.	Fewer freeze-thaw events causing potholes	Minor adverse	Medium	Not significant
			Rail	Impacts on maintenance budgets and leaf fall management from increased vegetation growth	Major adverse	Low	Not Significant
				Impacts on maintenance budgets and risk-based assessment due to changes in invasive species	Major adverse	Low	Not Significant
			Employees and Users/Operators.	Less disruption from fewer ice and snow events	Minor beneficial	Medium	Not Significant
				Better working conditions for road operatives	Minor beneficial	Medium	Not Significant
	Changes in solar radiation	Increase in solar radiation	Landscaping / Habitats	Changes in growing season and more vigorous growth	Negligible	Medium	Not Significant
			Ancillary Equipment	Increased solar gain (i.e. glare and warming of exposed surfaces)	Negligible	Medium	Not Significant

Variable		Projected Change	Receptor	Effect	Consequence	Likelihood	Significance
				UV degradation of exposed equipment e.g. cabling	Minor adverse	Low	Not Significant
			Substructure/Built Structures.	UV degradation of materials.	Minor adverse	Low	Not Significant
Wind	Gales and extreme wind events	Increase in mean wind speed and more frequent gusts	Substructure/Built Structures. Roads, Pedestrian and Cycleways.	Risk of damage to structures.	Moderate adverse	Low	Not Significant
				Erosion of banks and exposed surfaces	Minor adverse	Low	Not Significant
				Increased rate of deterioration of materials, potentially leading to early replacement	Negligible	Medium	Not Significant
				Damage from high winds and rain-infiltration into surfaces and materials	Minor adverse	Low	Not Significant
			Rail	In relation to OHL equipment and tracks, there is a risk to rolling stock, staff and asset failure from falling trees and debris (plastic bags, sheds and trampolines)	Major adverse	Low	Not Significant
				High crosswinds causing train instability	Major adverse	Low	Not Significant
				Damage to railway embankment and slope	Major adverse	Low	Not Significant

Variable		Projected Change	Receptor	Effect	Consequence	Likelihood	Significance
				Scour of bridge supports	Major adverse	Low	Not Significant
				Water on track or in underground structures	Major adverse	Low	Not Significant
				Damage to rail track	Major adverse	Low	Not Significant
				Other material damage to equipment and infrastructures	Major adverse	Low	Not Significant
				Supply cable sag or tensional failure	Major adverse	Low	Not Significant
			Landscaping / Habitats	Loss of vegetation	Negligible	Medium	Not Significant
				Falling trees	Minor adverse	Medium	Not Significant
			Ancillary Equipment	Signs, tall structures and high-sided vehicles at risk from increasing wind speeds.	Negligible	Medium	Not Significant
	Storms (snow, hail and lightning)	Increase in frequency of storms	Substructure/Built Structures. Roads, Pedestrian and Cycleways.	Destabilisation due to lightning strike	Moderate adverse	Very low	Not Significant
			Ancillary Equipment	Destabilisation due to lightning strike	Minor adverse	Very low	Not Significant
				Damage and disruption to power supply and other linked infrastructure.	Minor adverse	Medium	Not Significant

Variable		Projected Change	Receptor	Effect	Consequence	Likelihood	Significance
			Rail	For switches and crossings, there may be: frozen or snow-blocked points; and failure of point operating equipment	Major adverse	Low	Not Significant
				Lineside equipment may fail as a result of lightning strikes and electrical surges	Major adverse	Low	Not Significant
				Damage to railway embankment and slope	Major adverse	Low	Not Significant
				Scour of bridge supports	Major adverse	Low	Not Significant
				Water on track or in underground structures	Major adverse	Low	Not Significant
				Damage to rail track	Major adverse	Low	Not Significant
				Other material damage to equipment and infrastructures	Major adverse	Low	Not Significant
			Employees and Users/Operators.	Safety risks due to snow and ice.	Moderate adverse	Very low	Not Significant
				Electrical surges	Minor adverse	Very low	Not Significant

Variable		Projected Change	Receptor	Effect	Consequence	Likelihood	Significance
Soils	Soil moisture and runoff	Decrease in soil moisture in summer	Substructure/Built Structures. Roads, Pedestrian and Cycleways.	Shrinking and cracking of soils leading to subsidence	Moderate adverse	Low	Not Significant
			Landscaping / Habitats	Shrinking and cracking of soils leading to loss of vegetation and rockfall.	Negligible	Medium	Not Significant
				Damage to unpaved shoulders	Minor adverse	Medium	Not significant
			Ancillary Equipment	Shrinking and cracking of soils leading to subsidence	Minor adverse	Low	Not Significant
		Increase in soil moisture in winter	Substructure/Built Structures. Roads, Pedestrian and Cycleways.	Soil softening and erosion leading to collapse and settlement of structures	Moderate adverse	Low	Not Significant
				Increased slope instability	Moderate adverse	Low	Not Significant
				Soil saturation	Minor adverse	Medium	Not Significant
				Flooding and damage due to increased run-off	Moderate adverse	Medium	Not Significant
				Greater mobilisation of pollutants in the soil/ground	Minor adverse	Low	Not Significant
			Ancillary Equipment	Blockage of drains	Minor adverse	Medium	Not significant
				Water accumulation in low spots and/or on impermeable surfaces	Minor adverse	Medium	Not significant

Variable		Projected Change	Receptor	Effect	Consequence	Likelihood	Significance
			Site Contents and Business Continuity	Increased maintenance costs	Minor adverse	Low	Not Significant
				Increasingly difficult working conditions, including time available to undertake works	Minor adverse	Low	Not Significant
	Soil stability	Decrease in soil stability	Substructure/Built Structures. Roads, Pedestrian and Cycleways. Rail.	Subsidence impacting road, cycleway and footpath and structures (culverts)	Minor adverse	Low	Not Significant
				Failure of earthworks due to desiccation	Moderate adverse	Low	Not Significant
			Landscaping / Habitats	Loss of soil leading to loss of vegetation	Negligible	Medium	Not Significant
			Employees and Users/Operators.	Increased maintenance costs	Minor adverse	Low	Not significant
	Soil salinity / pH	Change in soil chemistry	Landscaping / Habitats	Change in soil chemistry may lead to loss of vegetation	Negligible	Low	Not Significant
			Substructure/Built Structures. Roads, Pedestrian and Cycleways. Rail.	Increased rate of deterioration of materials, potentially leading to need for early replacement	Negligible	Low	Not Significant

Variable		Projected Change	Receptor	Effect	Consequence	Likelihood	Significance
Humidity	Relative humidity	Decrease in summer humidity, increase in winter humidity	Landscaping / Habitats	Changes in growing season and more vigorous growth	Negligible	Medium	Not Significant
			Ancillary Equipment	Damage from condensation, mould growth and mildew	Negligible	Medium	Not Significant
			Material Durability	Excessive moisture in building materials	Minor adverse	Low	Not Significant
				Excessive moisture in sheltered surfaces (i.e. north- facing)	Minor adverse	Low	Not Significant
			Rail	Thermal expansion and contraction of rail line	Minor adverse	Low	Not Significant

ASSESSMENT OF THE IN-COMBINATION CLIMATE CHANGE IMPACTS ASSESSMENT

18.173 The identified receptor is the global climate and all development results in GHG emissions. Effects are not geographically constrained which means all development has the potential to result in a cumulative effect on GHG emissions. For this reason, it is not possible to define a study area and carry out a cumulative effects assessment for GHG emissions. As a result, consideration of the effects of the proposed development, together with other developments on GHG emissions, is not considered to be applicable.

18.174 The impacts resulting from the interaction of identified environmental impacts of the project with climate change are inclusive of those assessments set-out above.

18.175 Projected changes to average climatic conditions, as well as an increased frequency and severity of extreme weather events have the potential to impact the ability of the natural environment surrounding the Proposed Scheme to adapt to climate change.

18.176 It is considered that consented schemes coming forward in advance of the Proposed Development will have undertaken similar best practice appraisals and embedded mitigation into design to limit their respective effects on climate change.

18.177 Full details of embedded design measures that reduce the likelihood or severity in combination effects on receptors are detailed within the framework CEMP and other technical disciplines, such as that detailed in Chapter 9: *Air quality*, Chapter 10: *Noise and vibrat*ion, Chapter 12: *Ecology and biodiversity*, Chapter 14: *Surface water and flood risk* and Chapter 15: *Hydrogeology*. They are summarised within Appendix 18.4.

18.178 Taking into account the design and mitigation measures already identified for the Proposed Scheme, it is concluded that climate change is not anticipated to change the significance of any effects for the environmental topics assessed.

ADDITIONAL MITIGATION / ENHANCEMENT AND LIKELY RESIDUAL EFFECTS OF THE PROPOSED DEVELOPMENT AND THEIR SIGNIFICANCE

Influence of the Proposed Development on climate change

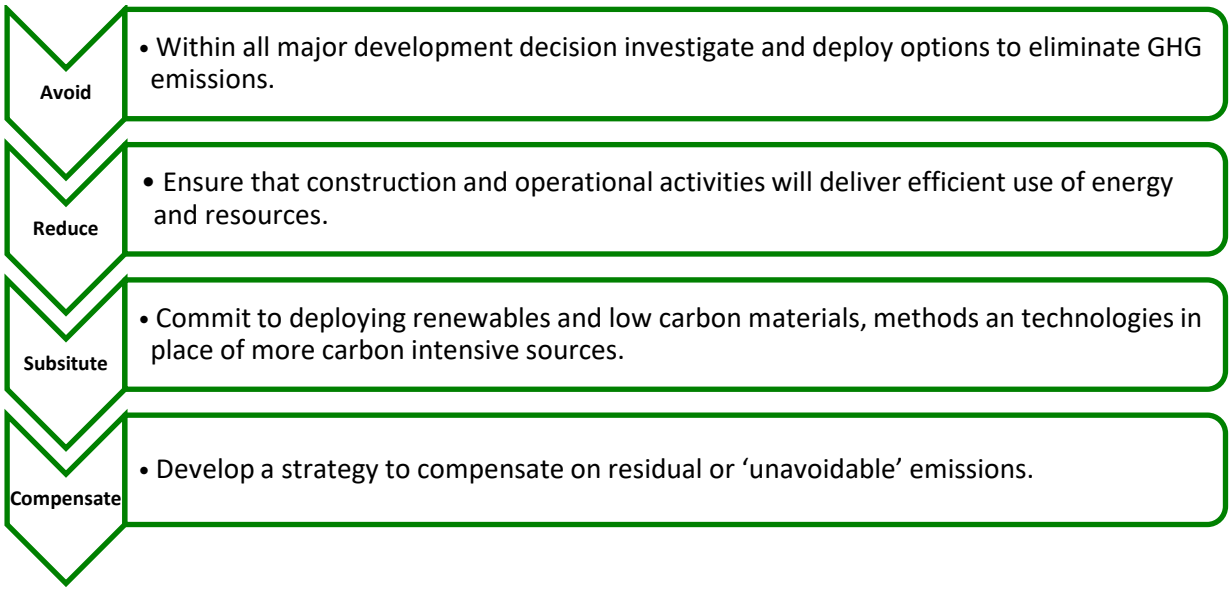
18.179 Embedded mitigation measures have been incorporated within the design of the Proposed Development or are standard practice measures that have been committed to, these are shown within Appendix 18.4.

18.180 The assessment of the Proposed Development considers the likely significant effects on vehicular emissions which could arise once all elements of the Proposed Development are complete.

18.181 Adaptation and mitigation are complementary strategies for reducing and managing the risks of climate change. Many adaptation and mitigation options can help address

climate change, but no single option is sufficient by itself[47]. The overarching principles for management of carbon emissions follows the process outlined in Figure 18.6. Where GHG emissions cannot be avoided, the assessment should aim to reduce the residual significance of a project's emissions at all stages – design, construction and operation.

Figure 18.6: EIA hierarchy for managing project related GHG Emissions (adapted from IEMA, 2015)



Construction phase

Direct sources and adaptation measures

18.182 During the construction phase, the potential for effects is associated with: emissions from vehicles and plant; particulate matter (PM); and dust associated with construction activities. A framework Construction Environmental Management Plan (CEMP) will be prepared to support the planning application for the Proposed Development, which would be agreed by the local authority. The Framework CEMP will include all best practice measures. As the emissions from construction phase traffic would be temporary, significant impacts are unlikely. Best practice mitigation measures should be included in the Framework CEMP to reduce emissions during construction, for example:

- switching off machinery and vehicles when not in use;
- reducing water consumption where possible;
- reducing landfill waste production, by increasing opportunities for recycling and

[47] IPCC (2014): Climate Change 2014 Synthesis Report.

planning material use;

- implementing a travel plan to reduce the impact of employee business travel (e.g. car sharing schemes or similar); and

- using efficient vehicles and machinery where possible.

18.183 During the demolition of on-site structures, the re-use, recycling and reduction of construction waste will be promoted to reduce the Proposed Development's overall carbon footprint by reducing the need to extract raw materials.

Indirect sources

18.184 As construction is likely to result in indirect GHG emissions, it is important to consider mitigation measures for the construction stage of the Proposed Development to reduce emissions associated with construction methods and embodied emissions in construction materials.

18.185 The CO_2 emissions of the Proposed Development will be calculated at each stage of design as it develops to ensure that it is meeting its project specific targets and legal requirements including Building Regulations Part L and to seek to achieve a BREEAM Very Good rating. This will consider both operational CO_2 emissions affected by design and embodied carbon. The Proposed Development should consider sourcing building materials from sustainable and, where possible, local sources whilst restricting materials which cause environmental harm. Ultimately, this strategy will reduce the overall carbon footprint and lead to a potential reduction in GHG emissions associated with the Proposed Development over its lifetime. Consideration would be given to the selection of materials used, and lower embodied carbon choices made, where practicable. Lower carbon concretes are available. Increasing the fly ash content of concrete can reduce the embodied carbon associated with it.

18.186 The following will also be considered as part of the detailed design of the Proposed Development:

- The re-use, recycling and reduction of any construction waste should be promoted to reduce the Proposed Developments overall carbon footprint by limiting the need to extract raw materials.

- Mechanisms should be established for designing out waste, reducing waste generated on-site, assessing the value of reusing or recycling materials and for reducing construction waste, and implementing procedures to sort and reuse/recycle construction waste on and off-site. A Site Waste Management Plan (SWMP) and the Operational Waste Management Plan should be consistent with the CEMP and as such, assist in achieving the BREEAM credits as required.

- Prioritise the procurement of high quality, durable, ethical and sustainable materials (from local sources where appropriate) to reduce lifetime embodied carbon emissions of the building process. Examples include:

- utilising a less carbon-intensive alternative to cement in concrete;
- increasing the use of low carbon products, such as timber, in lieu of high carbon materials such as steelwork;
- undertake a life cycle assessment during the detailed design stages to inform the selection of materials for the projects. there are a range of tools available considered best practice, including the BRE Green Guide to Specification; and
- liaising with contractors and suppliers to engage in their research to reduce embodied carbon.

18.187 By considering the effective mitigation measures, including the choice and procurement of building materials, it is expected that construction of the Proposed Development will result in a minor to negligible adverse effect.

Operational phase

Direct emissions

18.188 The assessment presents a worst-case scenario for CO_2 emissions as a result of vehicles though it does not consider plant machinery as the end users are yet to be defined.

18.189 It is expected that CO_2 emissions will decrease gradually over the Proposed Development's operational lifetime to account for Government standards and polices and industry trends as the proportion of hybrid and electric vehicles on the road will increase and petrol and diesel vehicles are phased out with new vehicles meeting progressively tighter European type approval emissions categories, referred to as 'Euro standards'. This in turn, could limit the effects on the tropospheric ozone and lead to a cooling effect, while the effect of reduced NO_X may also limit overalls effects on warming. The increase in electrical vehicles may also result in a decrease of direct emissions, though it will in turn increase the demand on the national grid where indirect emissions may result depending on the energy source.

18.190 As stated in the DfT's NPS for National Networks, SRFIs are favoured in government policy for their ability to provide sustainable development through the reduction of transport-based GHG emissions by encouraging a modal shift of freight from road to rail. Furthermore, this modal shift will help to reduce traffic congestion and improve air quality in the wider East Midlands region.

18.191 The Proposed Development includes a package of transport and access improvements which will help reduce GHG emissions associated with the transport of employees to and from the Main HNRFI Site during the operational phase. This includes provision of high quality, safe and convenient walking and cycling routes permeating through the Main HNRFI Site. Other examples of mitigation could include increasing the efficiency of plant by procuring cleaner equipment, phasing out fossil fuels by switching to low-carbon energy vehicles and plant and championing the use of

sustainable transport types.

18.192 The degree of reduction in emissions is dependent on the final design of the Proposed Development and future occupiers. Mitigation can be more cost-effective if using an integrated approach that combines measures to reduce energy use and the GHG intensity of end-use sectors, procure low-carbon energy and reduce net emissions. The implementation of some or all of the options above, where appropriate, will lead to an overall reduction in GHG emissions associated with the Proposed Development over its lifetime.

Sustainable credentials

18.193 The Proposed Development will consider measures to conserve water during operation, which increases the Proposed Developments resilience to future temperature rises and potential droughts as a result of climate change.

Indirect emissions reduction / carbon savings

18.194 TSH has committed to constructing energy efficient buildings with the intention of delivering sustainable development. To achieve this, they require all new projects to, at a minimum, achieve the following Green Building Certification standards:

- BREEAM: Very Good;
- DGNB[48]: Gold;
- LEED[49]: Silver; and
- EPC[50]: B or equivalent country operational energy performance standard.

18.195 During the operational phase of the Proposed Development, CO_2 emissions will be reduced through the following measures:

- employing renewable energy sources wherever possible;
- implementing facilities to minimise car travel for future employers and clients;
- implementing facilities to support EV charging for future occupiers;
- avoiding mechanical cooling and investing into natural cooling and natural ventilation;
- designing for a maximum use of daylight;

[48] German Green Building Council's certification system for sustainable construction.
[49] Leadership in Energy and Environmental Design rating system for sustainable construction. It is the US Green Building Council's most widely used rating system and provides a framework for healthy, highly efficient and cost-saving green buildings.
[50] Energy Performance Certificates which rate how energy efficient your building is using grades from A to G.

- optimising the building envelope for thermal regulation;
- designing automatic lighting controls and fit low energy and LED lighting throughout the Main HNRFI Site;
- implementing building management technology to control energy consumption;
- installing automatic meter reading technology;
- minimise the use of finite sources and use renewable sustainable elements instead;
- develop a green transport plan in collaboration with local councils;
- providing recycling facilities; and
- use recycled components wherever possible.

18.196 A focus on making consumption from businesses greener and more efficient will be an important part of the move towards a low carbon future. The CO_2 emissions of the Proposed Development will be calculated at detailed design, secured through planning conditions, to ensure that it is meeting legal requirements including Building Regulations Part L.

18.197 Around 75% of an industrial unit's heat is lost through the building fabric therefore taking a "fabric first"[51] approach is fundamental to the energy performance of a building. Improving and maintaining the building fabric offers many advantages and opportunities[52], including:

- reduced energy and maintenance costs;
- better temperature control and thermal comfort for occupants;
- lower capital expenditure (a more efficient, well-insulated building requires smaller heating and cooling systems, or even none at all);
- sound investment (better insulation or well-maintained/modified building fabric can increase a building's value and aesthetics); and
- compliance with regulation.

18.198 The potential for energy innovation across the Proposed Development includes different technologies such as carbon capture, utilisation and storage (CCUS[53]), energy storage and biogas/hydrogen as a replacement for gas. Smart technologies are increasingly important in alleviating grid strain and meeting the demands of new

[51] The building fabric refers to the roof, walls, windows, floors and doors of a building.
[52] Carbon Trust: Building Fabric; Energy saving techniques to improve energy performance of buildings.
[53] CCUS refers to methods and technologies that remove carbon dioxide from the flue gas and from the atmosphere, followed by the recycling of carbon dioxide for utilisation and safe and permanent storage options.

patterns and types of energy consumption. They can do this through increasing flexibility in a number of ways, including: shifting demand off-peak; matching demand with generation and digitising energy (such as with smart meters); allowing for better access to usage data and, therefore, to facilitate quick alterations.

18.199 Product and service footprint assessments, including life cycle assessments of the associated carbon emissions, are rapidly becoming an integral part of new development and eco-design. By assessing the environmental impacts of a product/service throughout its entire life cycle, the occupant will be able to identify 'hot-spots' for cost and emission reductions as well as support in developing environmental product declarations. Once implemented, well designed and managed Energy Strategies, Emissions Strategies and Environmental Management Systems (EMS) can help occupiers understand and reduce the environmental impact of their operations over the life-cycle of the Proposed Development as well as increasing the image and bettering the corporate and social responsibility of a business.

Government initiatives

18.200 Cleaner and more affordable energy should underpin the priorities for new energy generation. As such, the occupants should consider a range of appropriate renewable heating technologies, including heat pumps, biomass, solar thermal, and waste heat recovery that have significant potential to reduce carbon emissions.

Commitment to net zero development

18.201 Following a review of the latest scientific reporting in relation to climate change in 2019, TSH committed to a net zero carbon approach for new developments. In doing so, TSH has aligned itself with the framework definition for net zero carbon buildings developed by the UK Green Building Council (UKGBC).

18.202 This means that TSH intends to offset any outstanding output of carbon following the mitigation measures embedded into the design of the Proposed Development and measures which will be employed during the construction and operational phases.

18.203 As part of this carbon offsetting, TSH will adopt an approach to the measurement of residual carbon output which accords with the UKGBC's framework definition for net zero carbon in construction. TSH currently measures the carbon in construction of all new buildings, both during the design stage and at practical completion, and to ensure they achieve net zero for construction using UKGBC's net zero framework.

Vulnerability of the Proposed Development to climate change

Construction phase

18.204 The impacts of climate change on the Proposed Development during the construction phase would be managed through the outline CEMP / Code of Construction Practices (CoCP), which would contain detailed procedures to mitigate any potential impacts associated with extreme weather events, as listed in Table 18.8. This will compliment

best practice mitigation measures employed in the construction industry.

18.205 Construction contractors will use a short to medium-range weather forecasting service from the Met Office, or other approved meteorological data and weather forecast provider, to inform short to medium-term programme management, environmental control and impact mitigation measures.

18.206 The lead contractor will ensure appropriate measures within this outline CEMP / CoCP are implemented and, as appropriate, additional measures to ensure the resilience of the proposed mitigation of impacts during extreme weather events.

18.207 The lead contractors' Environmental Management System should consider all measures deemed necessary and appropriate to manage extreme weather events and should specifically cover training of personnel and prevention and monitoring arrangements. As appropriate, method statements should also consider extreme weather events where risks have been identified.

18.208 Table 18.20 details examples of mitigation measures for each of the identified receptors during the construction phase.

Table 18.20: Mitigation measures to protect receptors during the construction phase

Receptor	Mitigation
Substructure / Built Structures	Stormwater management system, including water tanks to store water for drought events, to reduce risk of flooding and subsidence; Vegetation planting to improve slope stability; Appropriate storage of construction materials when not in use to prevent drying out; Good design and earthwork failure monitoring; Establish a fire safety manual; Provision of lighting rods on built structures; and Appropriate ventilation to reduce humidity.
Landscaping / Habitats	Provision of guidance on ecological best practice methods to be followed in order to mitigate potential ecological effects during construction. Ensure potential on-site flood risk does not occur near sensitive ecological receptors. Ensure pollutants do not migrate to sensitive areas during heavy rainfall events.
Roads, Pedestrians and Cycleways	Ensure construction activities do not increase flood risk on travel infrastructure. Erect temporary fencing where appropriate to protect pedestrians and cyclists from heavy winds.
Rail	Trench excavation alongside rail line to protect from flooding.
Ancillary Equipment	Stormwater management system to stop drain blockage and

	water accumulation during heavy rainfall; Provide shading for equipment during heatwaves; Provide buffers to block heavy winds at wind-sensitive receptors; Ensure power supply and other linked infrastructure is appropriately located to avoid damage/disruption.
Employees and Users / Operators	Ensure adequate breaks are taken during hot weather. Ensure drinking water is readily available. Provision for areas to shelter during extreme rainfall events.

Operational phase

18.209 As no significant effects have been identified for the climate assessment, no monitoring of significant effects is proposed. End-users should however consider their individual effects and, where feasible, monitor annual emissions to better understand their impacts and identify potential savings and betterment as contributors and under best practice. No other specific monitoring activities would be required.

18.210 Adaptation and resilience to climate and weather-related risks would be considered periodically through maintenance regimes. A schedule of general inspections and principal inspections of each structure should be carried out to determine condition of the structure and identify any potential maintenance requirements. In addition, a list of extreme weather-related incidents (for example, road surface deformations, snow and ice, etc.) should be maintained by the occupant to assist in identifying thresholds which, when exceeded, would require maintenance. Where not specifically identified as embedded mitigation measures, the following should be implemented appropriately:

- emergency response and contingency plans in place;
- ensure effective, essential winter maintenance;
- regularly reviewed and updated winter maintenance plans;
- regular maintenance of assets to detect deterioration and damage;
- standard operating procedures in place for use in the event of necessary road/rail closure and/or traffic diversion;
- use of construction materials with superior properties which offer increased tolerance to fluctuating temperatures;
- road user warning systems in place in areas exposed to high winds;
- regular sweeping and cleaning to remove debris;
- effective vegetation maintenance;

- regular surveys, management and monitoring of street lighting to ensure asset stability; and
- regular maintenance and cleaning of drainage systems.

18.211 The Proposed Development will incorporate the following measures to mitigate the impact of heavy precipitation events:

- employ SuDS and other flood risk minimisation measures.

Tritax Symmetry (Hinckley) Limited

HINCKLEY NATIONAL RAIL FREIGHT INTERCHANGE

Preliminary Environmental Information Report

Chapter 19: Accidents and disasters

January 2022

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Details of how to respond to the public consultation are provided at the end of Chapter 1 of the PEIR and on the project website:

http://www.hinckleynrfi.co.uk/

This feedback will be taken into account by Tritax Symmetry (Hinckley) Limited in the preparation of its application for a Development Consent Order for the project.

Chapter 19 ◆ Major accidents and disasters

INTRODUCTION

19.1. This chapter sets out the approach that TSH has adopted to assess the likely effects of the Proposed Development in relation to the risk from major accidents and disasters.

19.2. The EIA Regulations 2017 (Schedule 4, Paragraph 8) require the consideration of:

'A description of the expected significant adverse effects of the development on the environment deriving from the vulnerability of the development to risks of major accidents and/or disasters which are relevant to the project concerned. Relevant information available and obtained through thorough risk assessments pursuant to EU legislation … or UK environmental assessments may be used for this purpose provided that the requirements of this Directive are met. Where appropriate, this description should include measures envisaged to prevent or mitigate the significant adverse effects of such events on the environment and details of the preparedness for and proposed response to such emergencies'.

EIA SCOPING OPINION

19.3. Paragraph 3.3.17 of the Secretary of State's 2020 EIA Scoping Opinion for the HNRFI Project advised that:

'The ES should include a description and assessment (where relevant) of the likely significant effects resulting from accidents and disasters applicable to the Proposed Development. The Applicant should make use of appropriate guidance (e.g. that referenced in the Health and Safety Executives (HSE) Annex to Advice Note 11) to better understand the likelihood of an occurrence and the Proposed Development's susceptibility to potential major accidents and hazards. The description and assessment should consider the vulnerability of the Proposed Development to a potential accident or disaster and also the Proposed Development's potential to cause an accident or disaster. The assessment should specifically assess significant effects resulting from the risks to human health, cultural heritage or the environment. Any measures that will be employed to prevent and control significant effects should be presented in the ES'.

19.4. In respect of the scope of the transport and traffic assessment for the HNRFI, the 2020 Scoping Opinion recommended that the assessment of major accidents and disasters should consider risks from hazardous loads (Scoping Report 2020 paragraph 4.2.1) and the potential impacts of an increase in rail freight movements, both generally and specifically in respect of the operation of the existing level crossing in the centre of Narborough on

the Leicester to Hinckley railway (paragraph 4.2.4). These are all being considered in the EIA. In respect of hazardous loads specifically, TSH envisages that most and potentially all freight passing through the HNRFI would be non-hazardous.

19.5. In its consultation response on TSH's EIA Scoping Report 2020, Public Health England (PHE) advised that:

Within the ES, PHE would expect to see information about how the applicant would respond to accidents with potential off-site emissions (e.g., flooding or fires, spills, leaks or releases off-site). Assessment of accidents should: identify all potential hazards in relation to construction, operation and decommissioning; include an assessment of the risks posed; and identify risk management measures and contingency actions that will be employed in the event of an accident in order to mitigate off-site effects.

19.6. Measures to manage or avoid the risks identified by PHE during the construction of the HNRFI will be set out in a Construction Environmental Management Plan (CEMP), which will be submitted in outline with the DCO application with the final version subject to later approval by the relevant planning authorities in accordance with a DCO Requirement (similar to a planning condition).

19.7. In respect of the risks identified by PHE at the operational stage, Chapter 1: *Introduction* of this PEIR explains that the EIA for the HNRFI is following Rochdale Envelope assessment principles. The level of information provided will be sufficient to fulfil the requirement of the EIA Regulations to assess the *'expected significant adverse effects of the development on the environment deriving from the vulnerability of the development to risks of major accidents and/or disasters which are relevant to the project concerned'* (EIA Regulations 2017, Schedule 4, Paragraph 8).

APPROACH AND CONSIDERATION OF VULNERABILITY

19.8. When considering the likely vulnerability of a development to major accidents or disasters there are three key criteria, derived from best practice and guidance set out in *Major Accidents and Disasters in EIA: A Primer*, published by the Institute of Environmental Management and Assessment (IEMA, September 2020) to be considered, as set out in table 19.1.

Table 19.1: Consideration of vulnerability of the Proposed Development to major accidents and / or disasters

Criteria	The Applicant's preliminary response
1) Is the development a source of hazard that could result in a major accident and/or disaster?	The Proposed Development is not a direct source of hazard over and above those standard construction and operational activities that are described in Chapter 3: *Project description* of this PEIR and which would be subject to relevant statutory and regulatory controls and

Criteria	The Applicant's preliminary response
	additional mitigation and safeguards enforced through the DCO. In common with other SRFIs it is anticipated that the HNRFI will cater for occupiers who will handle non-hazardous products and materials. In the event that an individual occupier wished to handle hazardous substances in quantities that would render them Controlled Substances as identified in the Planning (Hazardous Substances) Regulations 2015 it would be the occupier's responsibility to secure hazardous Substances Consent under the Planning (Hazardous Substances) Act 1990. The Health and Safety Executive (HSE) confirmed in response to the 2020 scoping exercise (HSE letter, 25 November 2020, in appendix 2 of the 2020 Scoping Opinion) that it had no comments on electrical safety in the proposed HNRFI. Photovoltaic installations and the proposed energy centre would operate in accordance relevant electrical safety regulations.
2) Does the development interact with any external sources of hazard?	The HSE confirmed that there are no major accident sites and no major accident hazard pipelines within the draft Order Limits (HSE letter, 25 November 2020, in appendix 2 of the 2020 Scoping Opinion). There are no licenced explosives sites in the vicinity. No other external sources of hazard have been identified that would interact with the Proposed Development or give rise to vulnerability. Freight carried by in the UK has a better safety record than freight carried by road. By enabling a transfer of freight from road to rail the HNRFI should thus help to reduce road accidents.
3) If an external man-made or natural hazard occurred, would the presence of the development increase the risk of significant environmental effect(s) to an environmental receptor	TSH has not identified any pathways by which the Proposed Development would increase the risk of significant environmental effects from external natural or man-made hazards. Where external hazards require an emergency response, the improved road connectivity afforded by the proposed

Criteria	The Applicant's preliminary response
occurring?	M69 J2 upgrade and the A47 link road would facilitate access to the scene of the event.

19.9. Having considered these criteria, the next stage involves determining whether, for those developments where a risk might be identified, existing design measures or legal requirements, codes and / or standards would adequately control the potential major accident and / or disaster, or whether it will be adequately covered by another assessment or topic.

19.10. The vulnerability of the HNRFI to major accidents and disasters from an environmental perspective will be taken into account in the assessment of a range of topics reported in the Environmental Statement that will accompany TSH's DCO application, including socio-economics, human health, transport (rail and road) and traffic, water resources and flood risk and greenhouse gases and climate change.

19.11. In most cases, existing approaches to managing risk already exist and can be used to understand the residual level of risk. The UK already has a structured framework of risk management legislation in place – notably, for example, for rail operations and flood risk - and it is not deemed appropriate to duplicate any risk quantification and management that will be undertaken in any event as part of the wider consideration of the DCO application, or from any future construction and operational procedures that the HNRFI would be subject to.

19.12. In appraising the vulnerability of the Proposed Development to major accidents and disasters, it is considered that the wide range of established safety and security legislation applicable to the construction and operation of a SRFI is generally sufficient to manage the risks identified.

19.13. During the pre-application stage TSH will continue to consult with local police, fire, ambulance and health services and Network Rail. The design of the HNRFI takes into account considerations including access for the emergency and security services.

SUMMARY

19.14. The DCO application will be accompanied by the following documents that explain provisions to avoid or reduce vulnerability to accidents and disasters:

- Construction Method Statement (CMS);
- Outline Construction Environmental Management Plan (CEMP);
- Outline Lighting Strategy (LS);
- Outline Construction Traffic Management Plan (CTMP);
- Other Consents and Licences report.

19.15. In addition, the DCO application will be accompanied by a Rail Operations Report that will include assessment of potential hazards to rail operations and their avoidance or mitigation. This will include consideration for the level crossing in central Narborough.

19.16. This integrated approach to control and management ensures that vulnerability to major accidents and/or disasters is being taken into account in the design and environmental assessment of the Proposed Development and the risks identified will be reduced to as low as reasonably practicable.

Tritax Symmetry (Hinckley) Limited

HINCKLEY NATIONAL RAIL FREIGHT INTERCHANGE

Preliminary Environmental Information Report

Chapter 20: Cumulative and in-combination effects

January 2022

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Chapter 20 ◆ Cumulative and in-combination effects

INTRODUCTION

20.1 Schedule 4 paragraph 5 of the EIA Regulations requires:

'A description of the likely significant effects of the development on the environment resulting from, inter alia: (e) the cumulation of effects with other existing and/or approved projects, taking into account any existing environmental problems relating to areas of particular environmental importance likely to be affected or the use of natural resources'. The text goes on to state that *'the description of the likely significant effects on the factors specified in regulation 5(2) should cover the direct effects and any indirect, secondary, cumulative, transboundary, short-term, medium-term and long-term, permanent and temporary, positive and negative effects of the development'.*

20.2 The EIA for the HNRFI will assess the ***cumulative effects*** of the Proposed Development and other development projects at both the construction and operational phases. At this stage the assessment is at a preparatory stage and the full assessment will be set out in the ES submitted with the application for the Proposed Development.

20.3 The ES will also provide an analysis of the ***in-combination effects*** that might arise where receptors experience multiple potentially non-significant effects from a range of impacts, which taken together might become significant – for example, noise and visual effects experienced in combination.

20.4 This chapter of the PEIR explains TSH's proposed approach for assessment of these effects.

METHODOLOGY

Cumulative effects

20.5 According to the Planning Inspectorate's Advice Note Seventeen: Cumulative effects assessment relevant to nationally significant infrastructure projects (version 2, August 2019, paragraph 3.1.1):

'*Other existing development and/or approved development' likely to result in significant cumulative effects should be identified and assessed by the applicant in the Cumulative Environmental Assessment (CEA) ….in order to establish the relevant 'other existing development and/or approved development' the applicant should determine the Zone of Influence (ZOI) for each environmental aspect considered within the ES . . .'.*

20.6 The ZOI for each aspect will be documented within the ES in tabular form. The 'other existing development and/or approved development' will be identified by reference to planning applications, relevant development plans and any other available sources including stakeholder consultations, in particular with the relevant planning authorities.

20.7 The following principles of the four stage assessment approach to cumulative assessment, as outlined in Advice Note 17, will be adopted in the ES for the HNRFI:

- ***Stage 1:*** Establish the Project's Zone of Influence (ZOI) and Long List of 'other existing development and/or approved development'

- ***Stage 2***: Establish a shortlist of 'other existing development and/or approved development' and apply a threshold criterion based on temporal scope, the scale and nature of development and any other relevant factors to assist in deciding whether to include or exclude the 'other existing development and/or approved development' identified;

- ***Stage 3:*** Information Gathering – compile detailed information on the 'other existing development and/ or approved development' shortlisted at Stage 2 including design and location, programme of construction, operation and decommissioning and environmental assessment information;

- ***Stage 4:*** Assessment – assess the cumulative effects of the Proposed Development with the shortlist of 'other existing development and/or approved development' based on factors including duration of effect, extent of effect, type of effect, frequency of effect, value and resilience of receptors and likely success of mitigation.

20.8 To enable a reasonable and proportionate assessment, the following criteria has been used to identify schemes which could result in potential cumulative effects with the Proposed Development in accordance with Table 2 in Advice Note 17:

- projects under construction;

- permitted application(s), but not yet implemented;

- submitted application(s), not yet determined;

- projects on the Planning Inspectorate's Programme of Projects where a scoping report has not been submitted;

- development allocations identified in the relevant Development Plan (and emerging Development Plans – with appropriate weight);

- development allocations identified in other plans and programmes (as appropriate) which set the framework for future development consents/approvals, where such development is reasonably likely to come forward.

20.9 Planning applications that have been refused and are not subject to appeal, and applications that have been withdrawn, will not be considered, as their implementation is not considered to be reasonably foreseeable.

20.10 Using these categories, developments have been identified by reference to the large application dataset an on-line database maintained by Glenigan, within an initial 5 km

radius of the Main Order Limits. For the purposes of this assessment, the other works outside of the Main Order Limits, such as junction improvements, have been excluded as they are not considered to be a source of significant cumulative effects. The initial 'long list' of 'other developments' is included in Appendix 20.1 of this PEIR and illustrated in Figure 20.1; this list will now proceed to Stage 2, as described above and will be reviewed in consultation with the relevant local planning authorities, to identify any other development in the area of the Proposed Development that should be considered prior to the completion of the ES.

In-combination effects

20.11 As explained above, the ES will also consider the in-combination effects. The in-combination effects identified in the technical topic chapters will be assessed using professional judgement and a qualitative assessment approach. To determine whether there is potential for a significant in-combination effect on an individual receptor, all residual effects for the HNRFI will be listed against the individual receptors affected, so that receptors that might be affected by more than one impact can be identified.

20.12 Where only neutral or negligible effects are identified, it would normally be considered that there is no potential for in-combination effects.

The current consultation

20.13 Consultees are invited to confirm the shortlist of projects to be considered in the assessment of cumulative effects to ensure that the shortlist of 'other existing development and/or approved development' identified for the CEA is comprehensive and accurate.

Tritax Symmetry (Hinckley) Limited

HINCKLEY NATIONAL RAIL FREIGHT INTERCHANGE

Preliminary Environmental Information Report

Chapter 21: Conclusion

January 2022

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Chapter 21 ◆ Conclusion

SUMMARY OF WORK TO DATE

21.1. With the benefit of the Secretary of State's EIA scoping opinion and the feedback from the current public consultation, the Applicant will refine its proposals and prepare an application for a DCO. Detailed technical studies will continue to feed into the design and assessment process, assisting the Applicant in its pursuit of an acceptable development proposal.

21.2. The ES submitted as part of the DCO application will identify the likely significant environmental effects (both beneficial and adverse) of the Proposed Development, the mitigation measures proposed to reduce the likely significant adverse effects. It will then report on any anticipated residual significant adverse effects once the mitigation measures have been taken into account.

21.3. The draft DCO will include the proposed means of enforcement and monitoring of the proposed mitigation measures in the form of a Register of Environmental Actions and Commitments (REAC). Based upon the work undertaken to date an emerging REAC is provided in table 21.1 at the end of this chapter. As the work undertaken to support the application for the DCO progresses, this will be updated to reflect the outcomes of the assessment. An updated REAC will then be presented in the ES that accompanies the DCO application.

THE CURRENT CONSULTATION

21.4. The Applicant welcomes comment on the potential significant environmental effects of the HNRFI project and the EIA methods described in this report. Comment is invited also on any other matters that should be addressed during the EIA and any sources of environmental information that would assist the EIA process. Details of how to submit comments are provided at the end of chapter one of this PEIR.

21.5. Upon completion of the consultation, a summary of responses received will form part of a Consultation Report that will be submitted with the DCO application for the Proposed Development.

ENVIRONMENTAL STATEMENT STRUCTURE AND CONTENTS

21.6. The HNRFI ES will incorporate all of the information required by Regulation 14 and Schedule 4 of the EIA Regulations 2017. It is proposed that the ES will comprise four volumes as follows:

Volume 1: The main text of the ES with tables.

Volume 2: Figures referred to in ES Volume 1.

Volume 3: Technical appendices containing supporting and background information on individual EIA topics.

Volume 4: The Non-Technical Summary (NTS), providing a summary of the ES.

21.7. Table 21.2 sets out the proposed structure of ES Volume 1 (the main text).

Table 21.2: The proposed structure of the HNRFI Environmental Statement Volume 1 (main text)

Section	Description
Introduction	Providing: • A brief introduction to the Applicant; • An overview of the HNRFI project; • A description of the consenting regime; • A description of the purpose and structure of the ES.
Site description	Description of the site and its surroundings.
Project description	Detailed description of the project and how the different aspects are interconnected / interrelated. The chapter will also provide an outline of the proposed construction methods indicative programme, and a description of the HNRFI in operation.
Project development and alternatives	A description of the site selection process and the alternative master plan and design options considered by the Applicant.
Relevant law and policy	A summary of law and policy relevant to the assessment of the environmental effects of the Proposed Development.
EIA assessment methodology	Detailing the assessment methodology that the EIA has followed.
Topic-based chapters	These chapters will report the findings of the EIA under the following topic headings: • Land use and socio-economic effects • Transport and traffic • Air quality • Noise and vibration • Landscape and visual effects • Ecology and biodiversity • Cultural heritage • Surface water and flood risk • Hydrogeology

Section	Description
	• Geology, soils and contamination • Materials and waste • Energy and climate change • Major accident and disasters Effects on human health will be considered in relevant topic-based chapters. The ES chapters will follow a standard format under the following main headings and will identify the significant environmental effects within the DCO Site: • Introduction • Relevant law, policy and guidance • Consultation feedback • Methodology and data sources • Baseline conditions • Assessment of likely significant effects • Avoidance and mitigation measures • Residual effects • Uncertainties • Conclusion
Cumulative, in-combination and transboundary effects	• A summary of the methodology undertaken to identify the long list and short list of developments to be considered in the cumulative assessment. • Assessment of the significant cumulative effects • Presentation of findings from in combination and transboundary assessments.
Conclusion	• Summary of main findings of the ES including residual significant effects. • Presentation of the REAC, including the proposed means of enforcement and monitoring for proposed mitigation measures.

Table 21.1: Emerging Register of Environmental Actions and Commitments (REAC) for the HNRFI

Ref	Location	Measure description	Justification	Securing mechanism
Land use and socio-economics				
No mitigation required.				
Transport and traffic				
TR1	Project-wide	Construction Traffic Management Plan (CTMP)	To address adverse effects of construction on the local highway network.	A DCO Requirement will require the submission of a final version of the CTMP, based closely upon an outline CTMP submitted with the DCO application, for approval by the relevant planning and highways authorities.
TR2	On and off site	Improved walking and cycling routes	To address operational effects on local walking and cycling routes.	These will be an inherent part of the project design with implementation enforced through the DCO.
TR3	On and off site	Improving public transport accessibility by enhancing X6 bus service timings and applying demand responsive transport for the train station to link with bus times.	To improve access to public transport.	A DCO Requirement will require the submission of a Green Travel Plan for approval by the relevant planning and highways authorities.
TR4	Project-wide	Travel Plan	To encourage walking, cycling, bus and car sharing.	A DCO Requirement will require the submission of a Green Travel Plan for approval by the relevant planning and highways authorities.
TR5	On and off site	Highway improvements, including	To mitigate traffic impact of the	These will be an inherent part of the

Ref	Location	Measure description	Justification	Securing mechanism
		M69 J2, distributor road, junction capacity improvements and traffic management measures. .	Proposed Development.	project design with implementation enforced through the DCO.
Air quality				
AQ1	Project-wide	Measures included in a Construction Environmental Management Plan (CEMP).	To mitigate construction effects on air quality.	A DCO Requirement will require the submission of a final version of the CEMP, based closely upon an outline CEMP submitted with the DCO application, for approval by the relevant planning authorities.
AQ2	Project-wide	Travel Plan (as above).	To reduce transport emissions of the Proposed Development during the operational phase.	A DCO Requirement will require the submission of a Green Travel Plan for approval by the relevant planning and highways authorities.
Noise and vibration				
NV1	Site	Limit construction hours and restrict night-time working during construction.	Reduce noise and vibration effects during construction.	Via an approved CEMP (see above).
NV2	Project-wide	Measures included in a CEMP.	Reduce noise and vibration effects during construction.	Via an approved CEMP (see above).
NV3	Project-wide	Method statements (construction management, traffic management, site management).	Reduce noise and vibration effects during construction.	Via an approved CEMP (see above).
NV4	Site	Acoustic barriers.	Reduce noise and vibration effects during operation.	These will be an inherent part of the project design with implementation enforced through the DCO.
NV5	Site	Noise sensitive site equipment, such	Reduce noise and vibration	These will be an inherent part of the

Ref	Location	Measure description	Justification	Securing mechanism
		as Rubber Gantry Cranes.	effects during operation.	project design with implementation enforced through the DCO.
Landscape and visual				
LV1	On and off site	Landscape and Public Rights of Way strategy (LPROWS).	Reduce effect of Proposed Development on the use and enjoyment of PROW.	A DCO Requirement will require the submission of a final version of the LPROWS, based closely upon an outline strategy submitted with the DCO application, for approval by the relevant planning authorities.
LV2	Project-wide	Measures included in a CEMP.	Reduce effects of construction on landscape.	Via an approved CEMP (see above).
Lv3	Project-wide	Construction Method Statement (CMS).	Reduce effects of construction on landscape.	A DCO Requirement will require the submission of a final version of the CMS, based closely upon an outline CMS submitted with the DCO application, for approval by the relevant planning authorities.
LV4	Project-wide	Arboricultural Method Statement (AMS).	Reduce effects of construction on landscape.	A DCO Requirement will require the submission of a final version of the AMS, based closely upon an outline AMS submitted with the DCO application, for approval by the relevant planning authorities.
LV5	Project-wide	Soil Management Plan (SMP).	Reduce effects of construction on landscape.	A DCO Requirement will require the submission of a final version of the SMP, based closely upon an outline

Ref	Location	Measure description	Justification	Securing mechanism
				SMP submitted with the DCO application, for approval by the relevant planning authorities.
LV6	Site	Visual screening, such as hoardings.	Reduce effects of construction on landscape.	Specifications to be appended to the CEMP.
LV7	Site	Construction light mitigation including directional fittings.	Reduce effects of construction on landscape.	Specifications to be appended to the CEMP.
LV8	Project-wide	Landscape and visual mitigation strategy.	Reduce effects of operation on landscape.	A DCO Requirement will require the submission of a final version of the Landscape Strategy, based closely upon an outline strategy submitted with the DCO application, for approval by the relevant planning authorities.
Ecology and biodiversity				
EB1	Site	Ecological Construction Method Statement (ECMS)	Reduce effect on ecological receptors during demolition and construction.	A DCO Requirement will require the submission of a final version of the ECMS, based closely upon an outline ECMS submitted with the DCO application, for approval by the relevant planning authorities.
EB2	Site	Ecology Management Plan (EMP)	Measures for ongoing management, maintenance and monitoring of ecological receptors and new habitats.	A DCO Requirement will require the submission of a final version of the EMP, based closely upon an outline EMP submitted with the DCO application, for approval by the relevant planning authorities.
Cultural heritage				

Ref	Location	Measure description	Justification	Securing mechanism
CH1	Site	Post-consent archaeological mitigation works.	To mitigate construction effects on buried archaeological remains.	A DCO Requirement will require the submission of a final version of an Archaeological Investigation and Mitigation Strategy (AIMS), based closely upon an outline AIMS submitted with the DCO application, for approval by the relevant planning authorities.
Hydrogeology				
HG1	Project-wide	Measures included in a CEMP.	Reduce effects of construction on Hydrogeology.	Via an approved CEMP (see above).
HG2	Site	Operation and Maintenance Plan	To inspect pollution control equipment.	Secured through a DCO Requirement
Surface water and flood risk				
SW1	Site	Monitor weather warnings and locate construction site welfare facilities outside of the floodplain.	To reduce the potential effect of flood risk.	Via an approved CEMP and CMS (see above).
SW2	Project-wide	Measures included in a CEMP.	Reduce effects of construction on surface water.	Via an approved CEMP (see above).
SW3	Site	Flood Risk Assessment (FRA).	To assess the risk of flooding at the Site.	The FRA will be appended to the ES submitted with the DCO application. Flood protection measures will be an inherent part of the project design with implementation enforced through the DCO.
SW4	Site	Drainage Strategy.	To reduce surface water runoff	A DCO Requirement will require the

Ref	Location	Measure description	Justification	Securing mechanism
			rates and direct runoff towards a positive drainage system.	submission of a final version of the Drainage Strategy, based closely upon an outline strategy submitted with the DCO application, for approval by the relevant planning authorities.
SW5	On and off site	Water Framework Directive Assessment	To assess impacts on water quality and apply mitigation.	Submission with the DCO application.
SW6	On and off site	Elmesthorpe – Bostock Close Sewage Pumping Station (SPS) upgrades.	To increase capacity to accommodate the Proposed Development.	Secured through DCO requirement to submit, agree and implement a foul drainage strategy
Geology, soils and contamination				
GSC1	Project-wide	Measures included in a CEMP.	Reduce effects of construction on soil.	Via an approved CEMP (see above).
GSC2	Site	Site investigation	Ensure that excavated materials are suitable for reuse.	Covered in a Construction Method Statement (CMS). A DCO Requirement will require the submission of a final version of the CMS, based closely upon an outline CMS submitted with the DCO application, for approval by the relevant planning authorities.
Materials and waste				
MW1	Project-wide	Measures included in a CEMP.	Reduce effects of construction on waste.	Via an approved CEMP (see above).
MW2	Project-wide	Site Waste Management Plan (SWMP) and accompanying Materials Management Plan (MMP).	Sets out a strategy to reduce waste.	A DCO Requirement will require the submission of a final version of the SWMP and MMP, based closely upon outline plans submitted with the DCO

Ref	Location	Measure description	Justification	Securing mechanism
				application, for approval by the relevant planning authorities.
Energy				
All mitigation proposed is embedded in design.				
Accidents and disasters				
No mitigation required.				