Tritax Symmetry (Hinckley) Limited

HINCKLEY NATIONAL RAIL FREIGHT INTERCHANGE

The Hinckley National Rail Freight Interchange Development Consent Order

Project reference TR050007

Environmental Statement
Volume 2: Environmental Statement Appendix

Appendix 7.1: Health and Equalitiesy Briefing Note

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Planning Act 2008

The Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009 Regulation 5(2)(a)

The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 Regulation 14

This document forms a part of the Environmental Statement for the Hinckley National Rail Freight Interchange project.

Tritax Symmetry (Hinckley) Limited (TSH) has applied to the Secretary of State for Transport for a Development Consent Order (DCO) for the Hinckley National Rail Freight Interchange (HNRFI).

To help inform the determination of the DCO application, TSH has undertaken 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.

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.

Further details about the proposed Hinckley National Rail Freight Interchange are available on the project website:

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

The DCO application and documents relating to the examination of the proposed development can be viewed on the Planning Inspectorate's National Infrastructure Planning website:

https://infrastructure.planninginspectorate.gov.uk/projects/east-midlands/hinckley-national-rail-freight-interchange/

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INTRODUCTION

Background

1.1 The scope and focus of the Development Consent Order (DCO) Environmental Impact Assessment (EIA) was agreed through the formal scoping process, where the overarching approach to considering and addressing health was embedded through each of the technical disciplines inherently protective of health.

1.2 While meeting the agreed approach, and both appropriate and sufficient for the protection of health through the regulatory assessment process, it was noted during the Preliminary Environmental Impact Assessment Report (PEIR) that the approach is technical in nature, geared to a technical audience, and focusing on precursors to any adverse health outcome.

1.3 While it is not possible to deviate from the formally agreed DCO approach, it was deemed beneficial to provide an additional Health and Equality Briefing Note (hereafter referred to as "this report") appended to the final DCO EIA, signposting to, and summarising how and where health and equality have been inherently considered, assessed and addressed.

1.4 This not only provides greater transparency, but helps interested parties to better navigate to areas of the EIA that address a specific health determinant; offers additional commentary to help separate perceived hazard from risk, and will more effectively facilitate the coverage of health and equality matters through the Local Impact Report, the Statement of Common Ground, and any health matters that are brought through to Issue Specific Hearing.

1.5 On the 22nd of September, 2013 a Rule 17 letter was received from the Planning Inspectorate requesting a consolidated health section to aid in navigating and disseminating the coverage of health through the DCO process. Given health had been scoped out, and the coverage of health already contained within the voluntary provided Health and Equality Briefing Note, further clarity was sought from the Planning Inspectorate, and a response was received on the 27th September 2023.

1.6 Here, the Planning Inspectorate requested the briefing note make further reference to local health needs and issues, offer greater clarity on how the project may impact on them, and offer greater clarity on specific health and wellbeing outcomes directly attributable to the proposed development, including the health impact from changes in visual setting, and its impact on mental health and wellbeing.

1.7 To aid the process, the inspector offered two Health Impact Assessment guidance documents, but reiterated that this is not an instruction to submit a full HIA (where it was agreed a HIA was scoped out). The Health and Equality Briefing Note was amended

accordingly, and the advice contained in the email is to be placed on the Planning Inspectorate Website as Section 51 advice.

1.8 This report has been prepared and updated following Section 17 and 51 input by the Health and Social Impact Assessment Team within the Savills Environment and Infrastructure division. The team has in excess of 23 years of experience embedding health and Health Impact Assessment (HIA) within the regulatory planning process, ranging from local planning through to DCO, Hybrid Bill and national policy. The team are acknowledged in much of the UK HIA Guidance, sit on the IEMA Health in Impact Assessment working group, authored sections of IEMA's recent health assessment scoping and significance criteria guidance, and recently provided regional HIA training to Local Authorities and Combined Authorities for the Office for Health Improvement and Disparities (OHID).

Report structure

1.9 The remainder of this report is structured as follows:

- Section 2: Policy, Legislative Context and HIA Guidance;
- Section 3: Approach and Methodology;
- Section 4: Project Profile;
- Section 5: Consultation;
- Section 6: Health and Wellbeing Baseline;
- Section 7: Health Appraisal;
- Section 8: Equality Appraisal; and
- Section 9: Conclusion.

POLICY, LEGISLATIVE CONTEXT AND GUIDANCE

Introduction

1.10 This section presents the national and local legislative and policy requirements and guidance pertinent to the assessment of health and equality. On the basis that a wide range of environmental, social and economic factors have the potential to influence health, many local policies which relate to these determinants are also relevant to health. However, to ensure a focussed list of relevant policies and to avoid duplication of policies pertinent to the inter-related technical disciplines that inform this report, the policies referenced in this section have been selected only if they explicitly mention health, wellbeing and/or equality.

1.11 Where appropriate, and as suggested through the Rule 51 submission, guidance for Health Impact Assessment has been further included, as well as the narrative on how this has been embedded within the regulatory assessment process, and delivered through this Health and Equality Briefing Note.

National policy and guidance

National Policy Statement for National Networks

1.12 Paragraphs 4.79 to 4.82 of the National Policy Statement for National Networks (Department for Transport, 2014) states that:

"National road and rail networks and strategic rail freight interchanges have the potential to affect the health, well-being and quality of life of the population. They can have direct impacts on health because of traffic, noise, vibration, air quality and emissions, light pollution, community severance, dust, odour, polluting water, hazardous waste and pests.

New or enhanced national network infrastructure may have indirect health impacts; for example if they affect access to key public services, local transport, opportunities for cycling and walking or the use of open space for recreation and physical activity.

As described in the relevant sections of this NPS, where the proposed project has likely significant environmental impacts that would have an effect on human beings, any environmental statement should identify and set out the assessment of any likely significant adverse health impacts.

The applicant should identify measures to avoid, reduce or compensate for adverse health impacts as appropriate. These impacts may affect people simultaneously, so the applicant, and the Secretary of State (in determining an application for development consent) should consider the cumulative impact on health."

1.13 The NPS thereby sets out the key health determinants, of which were included within the agreed scope of assessment through each of the respective technical disciplines protective of health, and preclude any significant health impact.

National Planning Policy Framework

1.14 The National Planning Policy Framework (NPPF) (Ministry of Housing, Communities & Local Government, 2021) sets out the planning policies for England. Promoting healthy and safe communities is a central theme, whereby the NPPF states that planning policies and decisions should aim to achieve healthy, inclusive and safe places which promote social interaction (including opportunities for meetings between people who might not otherwise come into contact with each other), are safe and accessible, and enable and support healthy lifestyles (paragraph 92).

1.15 Furthermore, the NPPF (paragraph 93) states that to provide the social, recreational and cultural facilities and services that communities need, planning policies and decisions should:

- plan positively for the provision and use of shared spaces, community facilities and other local services;
- take into account and support the delivery of local strategies to improve health, social and cultural wellbeing;
- guard against the unnecessary loss of valued facilities and services;
- ensure that established shops, facilities and services are able to develop and modernise, and are retained for the benefit of the community; and
- ensure an integrated approach to considering the location of housing, economic uses and community facilities and services.

1.16 The NPPS therefore sets the overarching purpose of planning, and facilitates a consistent approach to driving sustainable development that is supportive of public health (health protection, health promotion and health care). This informed the scope and focus of the assessment, agreed with statutory consultees and the Secretary of State through the DCO process.

National Planning Practice Guidance

1.17 The National Planning Practice Guidance (NPPG) (Ministry of Housing, Communities & Local Government, 2019) supports the NPPF and provides guidance across a range of topic areas, including 'healthy and safe communities'. It is recognised in the NPPG that the design and use of the built and natural environments, including green infrastructure are major determinants of health and wellbeing, whereby a "healthy place" is one which:

- supports and promotes healthy behaviours and environments and a reduction in health inequalities for people of all ages;
- will provide the community with opportunities to improve their physical and mental health, and support community engagement and wellbeing;
- is inclusive and promotes social interaction; and

- meets the needs of children and young people to grow and develop, as well as being adaptable to the needs of an increasingly elderly population and those with dementia and other sensory or mobility impairments.

1.18 As stated in the NPPG, planning and health need to be considered firstly in terms of creating environments that support and encourage healthy lifestyles, and secondly in terms of healthcare capacity. In addition, engagement with individuals and/or organisations, such as the relevant Director(s) of Public Health, will help ensure local public health strategies and any inequalities are considered appropriately.

1.19 Similar to the NPPF, the NPPG therefore sets the overarching purpose of planning, and facilitates a consistent approach to driving sustainable development that is supportive of public health (health protection, health promotion and health care). This informed the scope and focus of the assessment, agreed with statutory consultees and the Secretary of State.

Local policy and guidance

1.20 Relevant local policy documents comprise the Blaby District Local Plan (Core Strategy) (Blaby District Council, 2013), Blaby District Local Plan (Delivery) Development Plan Document (Blaby District Council, 2019) and Hinckley & Bosworth Local Development Framework Core Strategy (Hinckley & Bosworth Borough Council, 2009). Following the approach outlined within Section 2.1, local policies pertinent to health and wellbeing are outlined in more detail below.

Blaby District Local Plan (Core Strategy)

1.21 Policy CS14 states that 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 bio- diversity (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.

Blaby District Local Plan (Delivery) Development Plan Document

1.22 There is no explicit reference to health and/or wellbeing in the Blaby District Local Plan Development Plan Document, focusing instead on environmental precursors to health impacts (i.e. an environmental aspect, such as changes in air quality, that directly impacts human health), and the wider determinants of health (aspects other than those which are environmental, such as lifestyle or socio-economic factors, that impact human health) to protect and promote health.

Hinckley & Bosworth Local Development Framework Core Strategy

1.23 There is no explicit reference to health and/or wellbeing in the Hinckley & Bosworth Local

Development Framework Core Strategy, focusing instead on environmental precursors to health impacts, and the wider determinants of health.

The Equality Act

1.24 The Equality Act 2010 (the Act) (Equality Act, 2010) replaces previous anti-discrimination legislation to simplify and strengthen the law to tackle discrimination and inequality.

1.25 A key part of this is the introduction of the Public Sector Equality Duty that requires all public bodies (including planning) to play their part in making society fairer by having due regard to:

- eliminate unlawful discrimination, harassment, victimisation and any other conduct prohibited by the Act;
- advance equality of opportunity between people who share a protected characteristic and people who do not share it; and,
- foster good relations between people who share a protected characteristic and people who do not share it.

1.26 In its purest sense, this means that through active consideration, all public sector decision making is primed to identify and prevent discrimination, consider existing inequality, advance equality and tackle prejudice for the following protected characteristics (Government Equalities Office, 2011):

- age;
- disability;
- gender reassignment;
- pregnancy and maternity;
- race – this includes ethnic or national origins, colour or nationality
- religion or belief – this includes lack of belief;
- sex; and
- sexual orientation.

Public Sector Equality Duty

1.27 The Public Sector Equality Duty does not impose a legal requirement to conduct a formal Equality Impact Assessment (EqIA), where compliance involves demonstrating how the three aims of the Equality Duty have been consciously considered as part of the decision-making process (i.e. by giving due regard to prevent discrimination, explore opportunities to advance equality and tackle prejudice through decision making) (Equality and Human Rights Commission, 2014).

1.28 Within a planning context, the site allocation process during the development of the Local Plan will already include due regard (be it through an EqIA, or other structured consideration), where any identified risk of discrimination for protected characteristics is designed out, and opportunities to advance equality and tackle prejudice are considered, alongside meeting the needs of the wider community, through sustainable planning and development.

1.29 Should a potential equality hazard or opportunity be identified during the development of Local Plans, the Local Plan is refined to remove and address it, or if insufficient information is available, further investigation can be targeted at the project level by the LPA and proponents through area-specific policy. This then forms the basis for meeting the needs of the local population, supporting the sustainable development and growth of communities and the protected characteristics within them. This is then further tested during examination, where a Local Plan will not be accepted if there is any risk of discrimination.

1.30 At the project level, if a site that is supportive of the Local Plan and/or located on allocated land, equality will therefore already have been duly considered at the strategic level, but local circumstance and sensitivity can be further considered and addressed as part of a bespoke planning application.

1.31 Where equality matters are scoped in for consideration, the HNRFI in its entirety is judged on its own merit, and tested against if:

- there is evidence that the development of the HNRFI would result in discrimination against any protected characteristic;
- the development of the HNRFI advances equality of opportunity between people who share a protected characteristic and people who do not share it; and
- the development of the HNRFI fosters good relations between people who share a protected characteristic and people who do not share it.

1.32 The Public Sector Equality Duty is therefore one of informing and facilitating change for the better, and preventing discrimination through all public sector endeavours. It is not intended to stifle change in proximity to protected characteristic, as this can lead to segregation and isolation, and diminishes any opportunity to advance equality opportunity, or foster good relations between those with and without a protected characteristic.

1.33 In this instance, the project is identified in both the Blaby District Local Plan and the Hinckley & Bosworth Local Plan, and no credible evidence has been presented to suggest any discrimination from what is proposed. Furthermore, there is limited opportunity to advance equality opportunity during the construction and operation of the HNRFI, and similarly, limited opportunity to foster relations between those that share a protected characteristic and those that don't.

1.34 On this basis, the Public Sector Equality Duty has already been addressed at the strategic

level, and further tested through the DCO process via engagement and the exploration of construction and operational activities for any discriminatory activity. The site was selected due to the necessary proximity to the existing line, and environmental changes are again based on proximity and dispersion characteristics, and do not target or discriminate against any protected characteristic.

1.35 The assessment of environmental effects is then based on environmental objective thresholds protective of health, including the most vulnerable members of our society.

1.36 On the above basis, there is no credible equality impact, consent will only be granted where the project can demonstrate compliance with all environmental objectives, and due regard has been considered through the development of the Local Plans, tested through consultation of this application and through each of the individual technical disciplines protective of the environment and health.

Health Impact Assessment

Local Guidance

1.37 While the expectation and requirement for HIA are starting to develop in the Blaby District Council Regulation 18, the Hinckley & Bosworth Regulation 19 and the City of Leicester Regulation 19 Local Plans, none are finalised or accepted, and none present any specific HIA guidance.

1.38 Hinckley and Bosworth Policy PMDO7 (Health and Wellbeing) provides the most detailed narrative in this regard, establishing the need for a fit for purpose and proportionate HIA on projects where there is the potential for significant health impact (i.e. established through scoping), and further acknowledge that Leicestershire County Council are working to establish a standard HIA procedure around health considerations in planning.

1.39 Leicester City Policy HW02 (Health Impact Assessment) provide a threshold approach to HIA, based on the number of residential units, development floorspace, and consider cross boundary issues that might further justify the need for HIA should the Local Plan be accepted, but do not specify the approach, process or HIA methods to be applied, relying instead on scoping to set and justify an appropriate assessment, geared to the decision making process it is intended to inform.

1.40 The only other HIA guidance in use locally is a derivative of the Healthy Urban Development Unit (HUDU) HIA checklist, of which is geared towards prompting and qualitatively testing healthy urban design on residential developments, but is not well suited to major infrastructure projects.

National HIA Guidance

1.41 An extensive range of voluntary HIA Guidance exists in the UK, including the PHE 2020 HIA in spatial planning guide for public health and planning teams, identified by the Planning Inspectorate in their Rule 17 letter.

1.42 As detailed in the PHE guidance document, a generic process exists, of which can be

delivered through a stand-alone HIA, or integrated within the regulatory assessment process including EIA and the DCO process.

1.43 The process itself is less important than the objective, of which is to ensure health has been appropriately addressed and assessed through a proportionate and robust assessment, geared to the decision making process it is intended to inform.

1.44 In this instance, all of the generic stages of the HIA process have been integrated into the DCO process, scoped accordingly and delivered in accordance with the agreed scope.

1.45 To clarify:

- HIA Screening is the process whereby potential health hazards and pathways of exposure are initially reviewed alongside a legal and policy review to establish any national or local HIA requirement. This was conducted, and as shown in the Health and Equality Briefing Note, there was no specific trigger or requirement, for a separate HIA.

- HIA Scoping is the process where the rationale for a proportionate assessment and the method to be applied are established and set, and or the justification for aspects to be scoped out are agreed. This is necessary to ensure proportionality, but also set the reporting process and approach. In this instance, a population and health chapter and separate HIA were agreed to be scoped out, where health would be addressed through the overlapping technical disciplines protective of health. This doesn't mean health was removed from the process, where the HIA team remained on the project to test and inform the iterative refinement of the Proposed Development, respond to consultation responses, facilitate the Statement of Common Ground with key health stakeholders and respond to Written representations and the Local Impact Reports.

- The HIA itself would then typically comprises four key stages, including project profile, community profile, assessment/appraisal and recommendations, in this instance each of these tasks were conducted:

    1. A project profile was conducted to investigate potential health pathways (i.e. activities with the potential to influence health, both adversely and beneficially) as part of scoping. As a stand-alone HIA, this would typically form an introduction to the project, but also informs the following stages, where the parameters and geographic extent of the health baseline can be defined and the supporting health evidence base and assessment protocols can be selected. A project profile was included in the Health and Equality Briefing Note, and was iteratively updated with the refinement of the Proposed Development and through consultation responses.

    2. An appropriate and proportionate baseline was formed for each of the respective technical disciplines protective of health, establishing discipline specific sensitive receptors. The Health and Equality Briefing Note drew from and built upon these overlapping baselines to inform a wide health baseline to further explore and communicate local health circumstance, priorities and

needs. This formed the platform to the complementary health appraisal communicating how and where health has been assessed and addressed through the DCO process.

3. As agreed, a proportionate assessment/appraisal was conducted through the DCO process considering all credible health pathways through their respective technical disciplines protective of health, and the Health and Equality Briefing Note brought these together under one heading to aid transparency and signposting as to how and where health has been assessed and addressed.

4. In standalone HIA, recommendations are often offered in the conclusion section, but sitting outside of the regulatory assessment process, often lack sufficient weight to inform the project or process. In this instance, the HIA team have been working with and between each of the pertinent overlapping technical disciplines to inform design, mitigation and community support initiatives.

1.46 Running the length of HIA, community and key health stakeholder consultation is often included to test and refine the scope and focus of the assessment, but also form part of the supporting health evidence base in the assessment/appraisal stage. In this instance the HIA team have reviewed and provided responses to all health related issues collated throughout the DCO process, including the Rule 17 letters from the Planning Inspectorate on health and equality matters.

1.47 On the above basis, the Health and Quality Briefing Note, is in effect a HIA, working within the parameters and reporting structure agreed with the Planning Inspectorate, modified to respond to residual health concerns and improve transparency.

1.48 The remainder of this report provides the outputs to the stages identified above.

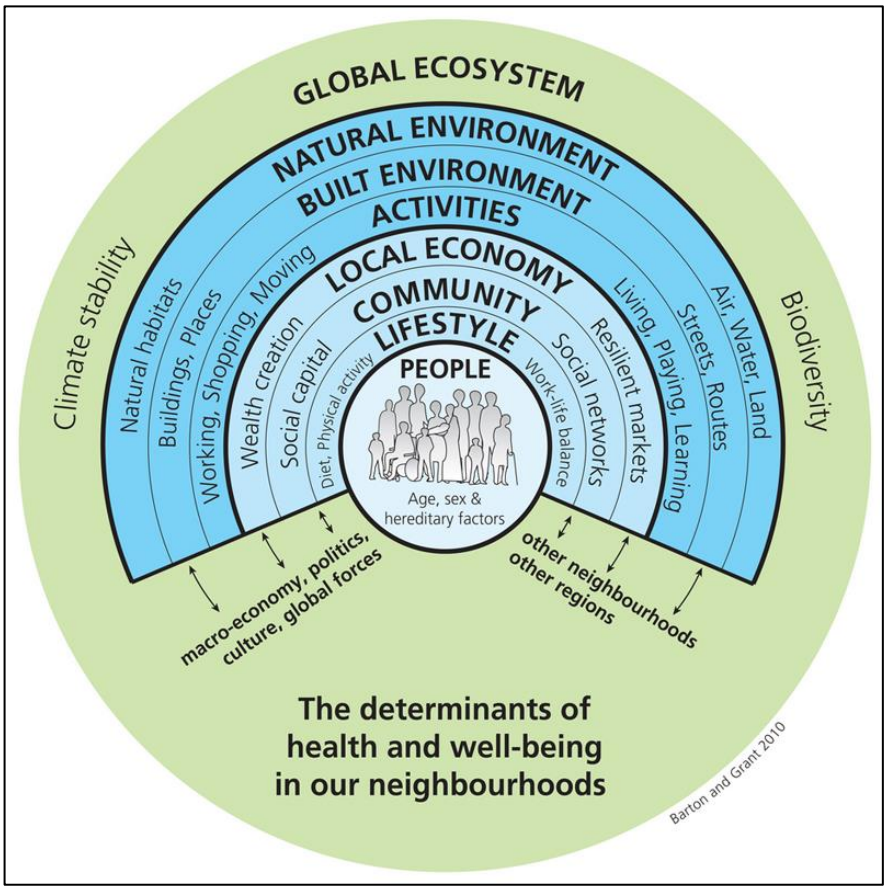
HEALTH ASSESSMENT APPROACH AND METHODOLOGY

Health Assessment Approach

1.49 The overarching approach has been to integrate health into the DCO process, where each overlapping technical discipline has investigated and assessed precursors to any credible adverse health impact. This Health and Equality Briefing Note consolidates the pertinent health pathways assessed under one heading to aid transparency, and where appropriate set risk in to context, and respond to any residual health and equality concerns.

1.50 The assessment of health and wellbeing impacts of the HNRFI applied a broad socio-economic model of health (see Figure 3.1) that encompasses conventional health impacts such as disease, accidents and risk, along with wider health determinants vital to achieving good health and wellbeing such as employment and local amenity. It addresses both physical and mental health outcomes, and also considers equality and social impacts where appropriate and possible.

Figure 3.1: The determinants of health and wellbeing in our neighbourhoods



Source: (Barton & Grant, 2006)

1.51 The assessment methodology applied to each of the overlapping technical disciplines and summarised here followed a source-pathway-receptor model to identify and assess population and health effects that are plausible and directly attributable to the HNRFI.

1.52 This forms the basis to setting proportionate and robust assessments, but can also help separate and respond to unfounded risk perceptions.

1.53 As shown in Table 3.1, a hazard source by itself does not constitute a health risk: it is only when there is a hazard source, a sensitive receptor and a pathway of exposure that there is any potential risk to human health. The same is true for potential health benefits where a positive influence must be present alongside a pathway of exposure and a receptor for there to be a potential health improvement.

1.54 Where a source-pathway-receptor linkage exists, it is then the nature of the specific hazard source or positive influence; the magnitude of impact via the pathway of exposure; and the sensitivity of the receptor that will determine what level of health risk or benefit is predicted, if any.

Table 3.1: Source-pathway-receptor model

Source	Pathway	Receptor	Plausible Health Impact	Explanation
x	✓	✓	No	There is not a clear source from where a potential health impact could originate.
✓	x	✓	No	The source of a potential health impact lacks a means of transmission to a population.
✓	✓	x	No	Receptors that would be sensitive or vulnerable to the health outcome are not present.
✓	✓	✓	Yes	Identifying a source, pathway and receptor does not mean a health outcome is a likely significant effect; health impacts should be assessed (describing what effect will occur and its likelihood) and likely health effects are then evaluated for significance.

1.55 It is the purpose of the technical disciplines in EIA to identify their respective discipline hazards, inform planning to remove or manage them, and to test and assess the final application.

1.56 As agreed during the formal Scoping Process with the Secretary of State and all Statutory Consultees, including Environmental Health Officers, the Health and Safety Executive and Public Health England (now the UK Health Security Agency and Office for Health Improvement and Disparities), the approach to considering the health and wellbeing of communities, was to focus on environmental socio, cultural and economic precursors protective of the environment and health. This means each technical discipline draws from a specialist expertise and evidence base to investigate any credible change in local circumstance from what is proposed, informing design and mitigation that precludes any significant risk to public health. For clarity:

- Land Use and Socio-economics (Chapter 7 of the ES) is a socio-cultural and economic health determinant that investigates the potential impact upon social capital and amenities important to community health and wellbeing.
- Transport and Traffic (Chapter 8 of the ES) is a socio-cultural and environmental health determinant that investigates the impact of changes in transport flow and

nature upon local road networks, safety, public access and community severance.

- Air Quality (Chapter 9 of the ES) is an environmental health determinant which investigates construction and operational emissions to air, assessed to discipline-specific legislation protective of the environment and our most vulnerable members of society.

- Noise and Vibration (Chapter 10 of the ES) is an environmental health determinant which investigates the potential impact of construction and operational noise upon the environment and community health and wellbeing, to discipline-specific legislation set to protect the environment and health.

- Landscape and Visual Effects (Chapter 11 of the ES) is a socio-cultural and behavioural health determinant that investigates the potential impact upon visual amenity, important to community wellbeing and health.

- Ecology and Biodiversity (Chapter 12 of the ES) is an environmental and socio-cultural health determinant that investigates the potential impact to local fauna, flora and areas of conservational value for current and future communities.

- Cultural Heritage (Chapter 13 of the ES) is a socio-cultural health determinant that investigates the potential impact upon local heritage important to community wellbeing at a national, regional and local level, assessed to discipline specific legislation, guidance and best practice.

- Surface Water and Flood Risk (Chapter 14 of the ES) is an environmental health determinant that investigates the potential effect on surface water quality and public water supplies from construction and operational activities, assessed to discipline-specific legislation set to protect the environment and health.

- Hydrogeology (Chapter 15 of the ES) is an environmental health determinant which investigates the potential effect on groundwater quality, resources and pollution risk to discipline-specific legislation set to protect the environment and health.

- Geology, Soils and Contaminated Land (Chapter 16 of the ES) is an environmental health determinant which investigates the potential risk of contamination and the mobilisation of pollutants assessed to discipline-specific legislation set to protect the environment and health.

- Materials and Waste (Chapter 17 of the ES) is an environmental health determinant centred on sustainability to protect the environment and health of current and future generations.

- Energy and Climate Change (Chapter 18 of the ES) is an environmental health determinant investigating and mitigating the potential contribution to climate change, but also exploring local circumstance and vulnerability to climate change, adaptation and resilience.

- Major Accidents and Disasters (Chapter 19 of the ES) is an environmental health determinant that explores any potential for catastrophic events and the means to protect public health.

- Cumulative and In-combination Effects (Chapter 20 of the ES) is an all-encompassing health determinant that considers all of the above in combination with other existing and consented projects to protect the environment and health.

1.57 Engagement and written responses on the Preliminary Environmental Impact Assessment (PEIR) and subsequent Local Impact Reports have not identified any gap in the scope of health determinants covered within the listed technical assessments, and confirm the scope and focus of the final Environmental Impact Assessment, and the health pathways contained in this report remain appropriate.

PROJECT PROFILE

Context

1.58 This section provides context to the construction and operational activities with the potential to influence health and wellbeing (both adversely and beneficially), setting the rationale for any credible health determinants that require further assessment. This process was first considered through the formal scoping process, and was iteratively tested and refined through the planning process and then again during consultation on the Preliminary Environmental Impact Report, through a review of the Written Responses and the Local Impact Reports .

Site description, setting and context

1.59 Figure 2.1 *Descriptive terms used for land inside the Main Order Limits* shows the Main HRNFI site, Main Order Limits and Order Limits, of which are described below.

1.60 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'.

1.61 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 referred to as the 'Main Order Limits'.

1.62 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.

1.63 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.

1.64 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.

1.65 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.

Project description summary

1.66 In summary, the Main HNRFI Site comprises the following main components:

- the demolition of Woodhouse Farm, Hobbs Hayes, Freeholt Lodge and the existing bridge over the Leicester to Hinckley railway on Burbage Common Road;
- 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;
- 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;
- 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 42.4 megawatts (MW), providing direct electricity supply to the building or exporting power to battery storage in the energy centre;
- an energy centre incorporating an electricity substation connected to the local electricity distribution network, battery storage (adjacent to each unit and at the energy centre) and a gas-fired combined heat and power plant (designed to be ready for 100% hydrogen in the grid gas supply) with an electrical generation capacity of up to 5 megawatts (MW). Total electricity generation capacity at the Main HNRFI Site is therefore 47.4 MW;
- a lorry park with welfare facilities for drivers and HGV fuelling facilities;

- 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;
- terrain remodelling, hard and soft landscape works, amenity water features and planting;
- noise attenuation measures, including acoustic barriers up to six metres in height;
- 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;
- 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;
- utility compounds, plant and service infrastructure;
- security and safety provisions inside the HNRFI including fencing and lighting; and
- drainage works including groundwater retention ponds, underground attenuation tanks and swales.

1.67 In addition, highway works comprise:

- 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.
- 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.
- 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;
- 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 (including pedestrian level crossings);
- 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.

- 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.

- 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;

- 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 (including suitably ramped pedestrian crossing). ~~In addition, pedestrian level crossings serving.~~

Study area

1.68 Due to the varying nature and exposure characteristics for each of the health pathways, the study area does vary. As an example, environmental health determinants (such as changes to air quality and noise exposure) typically have a local impact where the potential change in hazard exposure is limited by source type and physical dispersion characteristics. As a result, each overlapping technical discipline presents its own discipline specific baseline, including the identification of topic specific sensitive receptors. The Health and Equality Briefing Note compliments this and defines the local study area for health-specific baseline statistics relating to human health effects from environmental changes on several wards (Croft Hill; Hinckley de Montfort; Burbage St Catherine's & Lash Hill; Stanton & Flamville; Barwell; Broughton Astley-Primethorpe & Sutton; Cosby with South Whetstone; Lutterworth West; Ullesthorpe; and Revel and Binley Woods), using district (Blaby; Hinckley & Bosworth; Harborough; and Rugby), regional (East Midlands and West Midlands) and national (England) averages as comparators. Where data is not available at ward-level, district-level data is presented as a representative alternative.

1.69 Socio-economic health determinants (such as employment and related income generation) have a wider geographic scope of influence than environmental health determinants due to the willingness to commute significant distances to work. Complementing the baseline in the ES Socio Economic Chapter, related socio-economic heath data has been collected at the ward-level, with a focus on district-level statistics (Blaby; Hinckley & Bosworth; Harborough; and Rugby), using regional (East Midlands and West Midlands) and national averages as comparators.

1.70 Section 6 of this briefing note (Health and Wellbeing Baseline) provides a summary of local demographic and health context that has been applied to inform the project, and these study areas are addressed within each of the respective technical disciplines, including the relevant sensitive receptors for the purpose of assessment and the application of appropriate significance criteria.

CONSULTATION

Health Scoping

1.71 The Scoping Report (2020) detailed the following:

"The development proposed is not associated with an understanding of linked health implications and is not considered to represent a serious risk to public health. The ES chapters on air quality, noise and vibration, flood risk, hydrogeology and contamination will assess the potential impact of the construction and operational phases of the development on human health. Mitigation will be proposed to address any identified risk to human health in accordance with appropriate industry standards.

Given the nature of the proposed development not being directly linked with risks to human health and the consideration of the issue in the relevant technical chapters of the ES it is not intended to provide a separate chapter on human health in the ES."

1.72 As detailed in the associated Scoping Opinion (2020), the Inspectorate was satisfied with the proposed approach, and all credible health pathways have been assessed through the PEIR and the final DCO ES.

1.73 However, it was highlighted that the Scoping Report (2020) made no mention of possible health impacts of Electric and Magnetic Fields (EMF), and that the ES should include an assessment of possible EMF impact should significant effects be likely to occur.

1.74 This was the case as the HNRFI, including all renewable energy generation, transmission, storage and use will comply with the former Department of Energy and Climate Change voluntary code of practice for demonstrating compliance with public exposure guidelines for EMFs. This ensures compliance with the reference levels in the 1998 International Commission on Non-Ionizing Radiation Protection (ICNIRP) guidance for both occupational and public exposures set to protect health. On this basis, the HNRFI does not constitute any significant risk to health from EMF, and a dedicated EMF assessment was not required.

1.75 For additional clarity, an EMF section is including in Section 7 of this briefing note (Health Appraisal).

Statutory section 42 consultation

1.76 A summary of matters raised during statutory consultation by section 42 consultees is provided in Table 5.1, and was applied to test and establish any potential health assessment gaps.

Table 5.21: Summary of section 42 consultation responses

Consultee	Consultation stage	Comment	Response
Aston Flamville Parish Council	Scoping Opinion	Para 5.20 states that no specific Human Health Scoping will be done. This is unacceptable and a scoping for Human Health should specifically be done for the Aston Firs Community.	As agreed, health has been integrated into the regulatory assessment process, and focusses on any credible precursor to adverse health outcomes.
Blaby District Council	Scoping Opinion	Any major infrastructure should carry out a full Health Impact Assessment. There is no mention of the impact of the proposed development on the below and we are of the view that there should be: • current state of the population's health and wellbeing • main issues affecting health in the population • health and wellbeing trends • communities' perceptions of their health • education • amenities – impact of 8,400 workers on wider determinants such as Health, Education. In terms of the impact on Burbage Common and Freeholt Wood around physical inactivity, cardiovascular disease and obesity mental health benefits from access to nature and green space and water, poor environment leading to physical inactivity, mitigation measures have been discussed i.e. walking and cycling routes – these need to be linked to the wider networks in the community to ensure that people can use them to access facilities and community hubs and do not reduce the accessibility of amenities for existing communities.	Section 06 (Health and Wellbeing Baseline) presents a number of indicators to establish existing local health and wellbeing circumstance. Regarding the potential impact on amenities, this is not considered material on the basis that 70% of operational jobs could be relocated from existing, functionally sub-optimal distribution premises in the Leicester and Leicestershire Enterprise Partnership (LLEP) area. Regarding the impact on physical inactivity, agricultural land will be permanently lost due to the construction of the HNRFI. To clarify, there would be no loss of land at Burbage Common Woods and other green space. In a health and wellbeing context, the permanent loss of land does not remove any opportunity for access to physical activity/recreation on the basis that comparable and accessible alternative spaces exist nearby and can be used for the same purposes. Furthermore, mitigation measures would be in place to ensure the area remains accessible by non-motorised users, and is linked to the wider networks.
Burbage Parish Council	Scoping Opinion	Whilst the applicant has claimed there will be no impact to Health due to the processes employed at the site, we believe a wider review of the quality of life and impact upon health of the development should be undertaken. This review should specifically include the nearby residents in approximately 180 mobile homes who will be immediately dominated by the development. The ES should assess the environmental and psychological issues of the residents being located so close to, and dominated by, the warehousing. The ES should also assess the quality of life impacts in the residents of the surrounding villages of Burbage, Sapcote, Stoney Stanton & Elmesthorpe.	Each individual technical discipline considers tangible changes in environmental and socio-economic circumstance directly attributable to what is proposed, and considers appropriate sensitive receptors. Drawing from these key outputs, potential impacts on amenity and wellbeing are discussed in Section 07 (Health Appraisal) across a range of health determinants.
Public Health England	Scoping Opinion	We believe the summation of relevant issues into a specific section of the report provides a focus which ensures that public health is given adequate consideration. The section should summarise key information, risk assessments,	The agreed approach was to fully integrate health into the regulatory assessment process. Section 07 (Health

Consultee	Consultation stage	Comment	Response
		proposed mitigation measures, conclusions and residual impacts, relating to human health.	Appraisal) supplements the agreed approach to offer greater transparency.
		Compliance with the requirements of National Policy Statements and relevant guidance and standards should be highlighted.	Each of the individual technical disciplines provides a policy review pertinent to the subject, and the subsequent associated assessments comply with any specific requirements.
		Pollutants associated with road traffic, particularly particulate matter and oxides of nitrogen are non-threshold. We support approaches which minimise or mitigate public exposure to non-threshold air pollutants, address inequalities (in exposure), maximise co-benefits (such as physical exercise). We encourage their consideration during development design, environmental and health impact assessment, and development consent.	The air quality assessment assesses to the regulatory environmental objective thresholds protective of health. Section 07 (Health Appraisal) expands on this, setting potential risk into further context.
		We request that the applicant confirms either that the proposed development does not include any sources of EMF that have a potential human health impact; or ensures that an adequate assessment of the possible EMF impact is included in the ES.	The HNRFI includes renewable energy generation, transmission, storage and use, as well as consumption via the grid connection. However, all generation, transmission, storage and use is compliant with the former Department of Energy and Climate Change voluntary code of practice for demonstrating compliance with public exposure guidelines for EMFs. This ensures compliance with the reference levels in the 1998 International Commission on Non-Ionizing Radiation Protection (ICNIRP) guidance for both occupational and public exposures set to protect health. On this basis, the HNRFI does not constitute any significant risk to health from EMF, and a dedicated EMF assessment was not required. However, for clarity, an EMF section is contained within Section 07 (Health Appraisal).
		Should the applicant wish to scope out any of the following determinants, the ES must provide adequate justification: • Access to local public and key services and facilities • Access to good quality affordable housing • Access to healthy affordable food • Access to the natural environment	As per the agreed scope and focus, a proportionate assessment on credible changes in environmental circumstance has been undertaken, focusing on any precursor to adverse health outcomes thorough the respective technical discipline. Section 07 of this briefing note (Health Appraisal) signposts to how and where health is appropriately

Consultee	Consultation stage	Comment	Response
		• Access to the natural environment within the urban environment • Access to leisure, recreation and physical activities within the urban and natural environments • Access to/by public transport • Opportunities for access by cycling and walking • Links between communities • Community severance • Connections to jobs • Connections to services, facilities and leisure opportunities • Employment opportunities, including training opportunities • Local business activity • Regeneration • Tourism and leisure industries • Community/social cohesions and access to social networks • Community engagement • Land use in urban and/or rural settings • Quality of urban and natural environments	assessed and addressed in the ES, and provides additional context where appropriate.
		A separate chapter bringing together all aspects of population and human health must be contained within the ES. This should identify impacts separately across the different communities to be affected.	
		The ES should report effects at community level in order to assist the identification of the overall potential effects across a range of impacts.	
		There should be parity between mental and physical health, and any assessment of health impact should include the appreciation of both.	
		The overall risk to NMU and impact on active travel should be considered on a case-by-case basis, taking into account, the number and type of users and the effect that the temporary traffic management system will have on their journey and safety. The assessment boundary for NMU must be defined and justified within the ES and be agreed with the local authority.	ES Chapter 8: *Transport and Traffic* gives due consideration to the potential effects on non-motorised users. The results of this assessment are summarised in Section 07 (Health Appraisal), whereby the associated impact in a health and wellbeing context is communicated.

Consultee	Consultation stage	Comment	Response
		Any traffic counts and assessment should also, as far as reasonably practicable, identify informal routes used by NMU or potential routes used due to displacement. The final ES should identify the temporary traffic management system design principles or standards that will be maintained with specific reference to NMU. This may be incorporated within the Code of Construction Practice. In relation to PRoW adequate assessments must be made of usage. This may be through a blend of counts, visual inspection of routes, fitness tracking apps and consultation with the Local authority and local communities. The scheme should continue to identify any additional opportunities to contribute to improved infrastructure provision for active travel and physical activity.	
		The ES should identify the methodology used to assess the nature and scale of the workforce at both construction and operation phases, e.g. Gravity Model. It should identify the split for home and non-home based workers within the travel to work area for the scheme. Demand for temporary accommodation by the construction and operational work force should be identified and an assessment made regarding the impact on local accommodation supply and affordability. The current assessment of vacancy within the private rented sector should not be reliant on national average rates, which may not mirror the situation within the study area. An assessment should recognise loss of availability through frictional loss (normal turnover of occupiers), those unsuitable for occupation or those outside of the price range of the non-home based workers. An accurate assessment of spare capacity within the private rented sector is required. Given the potential of other large developments the cumulative effect on accommodation provision should be included.	ES Chapter 7: *Land Use and Socio-economic Effects* applies gravity modelling to establish the likely distribution of income and employment during construction and operation. The results of this assessment are summarised in Section 07 ~~7~~ (Health Appraisal), whereby the associated impact in a health and wellbeing context is communicated.
		The ES should assess the current and future demand on local services, including health care services and the subsequent assessment of significance as a result of the DCO. The ES should report on the results of engagement with the local healthcare system and any proposed embedded or additional mitigation.	Regarding the potential impact on local services, this is not considered material on the basis that 70% of operational jobs could be relocated from existing, functionally sub-optimal distribution premises in the Leicester and Leicestershire Enterprise Partnership (LLEP) area.
		We expect an ES to include consideration of the need for monitoring and the ES should clearly state the principles on which the monitoring strategy has been established, including monitoring in response to unforeseen impacts or effects.	The results of Section 07 ~~7~~ (Health Appraisal) establish that there would be no significant adverse impacts on health. As such, no health specific monitoring is proposed, and

Consultee	Consultation stage	Comment	Response
			the focus on precursors to any health risk remains appropriate.
Sharnford Parish Council	Scoping Opinion	Should the EIA consider the detrimental effect on health and wellbeing of Aston Firs residents with light, vibration, and noise pollution. Should the EIA consider the detrimental effect on health and well-being of Aston Flamville and Sharnford residents with noise and vibration from increased traffic through their respective villages, together with mental health issues through sleep deprivation and loss of footpaths and bridleways.	As per the agreed scope and focus, a proportionate assessment on credible changes in environmental circumstance has been undertaken, focusing on any precursor to adverse health outcomes thorough the respective technical discipline. Section 07 (Health Appraisal) signposts to how and where health is appropriately assessed and addressed, and provides additional context where appropriate.
The National Health Service Commissioning Board and Leicester, Leicester and Rutland Clinical Commissioning Group (LLR CCG)	Statutory Consultation 2022	Identified key themes, including air quality, noise and wider health impacts, that will impact upon the population health outcomes. Regarding air quality, LLR CCG welcomed the presence of Air Quality Management Areas and support Public Health England's conclusion that evidence indicates there is no threshold below which health effects do not occur for NO2 or PM2.5. They also stated they would like to better understand the possibility of using electric vehicles within construction fleets to limit exposure to air pollution. LLR CCG welcomed the proposed noise mitigation considerations. They also welcomed the creation of cycling and walking routes but wanted to understand if behaviour change factors had been considered.	Recognising the non-threshold nature of air pollutants, the absolute change in NO_2, PM_{10} and $PM_{2.5}$ is discussed in Section 07 (Health Appraisal). The application of noise mitigation and associated health and wellbeing impacts are discussed in Section 07 (Health Appraisal). The potential impact on behaviour changes (i.e. physical activity and recreation) is also given due consideration in the context of the required PRoW diversions.

1.77 While no additional health hazards or gaps in the assessment scope were identified, a consistent message was a desire for a separate HIA. To adhere to the scope agreed with the Planning Inspectorate, but respond to the section 42 consultation responses, the Health and Equality Briefing Note was provided, including all the stages of HIA, albeit without the heading to remain consistent with the agreed scope and reporting structure.

Statutory section 47 local community consultation

1.78 Matters raised by the local community with relevance to health and wellbeing are outlined in Table 5.2, with a response detailing how and where these are addressed also provided.

Table 5.1~~2~~: Summary of local community consultation response themes

Theme of concern	Response
Concern over the general health and wellbeing of Elmesthorpe village residents	Elmesthorpe is the closest village from the HNRFI. Due to its proximity, representative sensitive receptors reside within Elmesthorpe village and as such, have been considered within the assessments undertaken as part of the ES. The results of these assessments and the associated impact on health and wellbeing are discussed in Section 0~~7~~ (Health Appraisal).
Loss of Burbage common woods and other green space reducing areas available for the public, and associated physical and mental health concerns	There would be a permanent loss of agricultural land due to the construction of the HNRFI. To clarify, there would be no loss of land at Burbage Common Woods and other green space. In a health and wellbeing context, the permanent loss of land does not remove any opportunity for access to physical activity/recreation on the basis that comparable and accessible alternative spaces exist nearby and can be used for the same purposes.
Concern that the proposed mitigation (e.g. relating to landscaping and PRoW diversions) does not adequately offset impacts on community wellbeing	
Health impacts associated with noise, air quality, light and traffic	Potential impacts associated with air quality, noise, transport nature/flow rate, surface water and flood risk, visual amenity (including light) and socio-economic factors are assessed in the following chapters: ES Chapter 9: *Air Quality*, Chapter 10: *Noise and Vibration*, ES Chapter 8: *Transport and Traffic*, ES Chapter 14: *Surface Water and Flood Risk*, ES Chapter 7: *Land Use and Socio-economics* and ES Chapter 11: *Landscape and Visual Effects*. The results of these assessments and the associated impact on health and wellbeing are discussed in Section 0~~7~~ (Health Appraisal).
Night time works associated with train movements	The HNRFI would be operational during the night time period. The potential impacts associated with this have been considered within the assessments undertaken as part of the ES. The results of these assessments and the associated impact on health and wellbeing are discussed in Section 0~~7~~ (Health Appraisal).
Disproportionate impacts on vulnerable or disadvantaged populations	Each individual technical discipline considers sensitive receptors and assess to appropriate standards protective of the environment and health, including the most vulnerable members of our society.
Dust will be damaging to asthma	As a disease of the respiratory system, the potential for impacts on asthma is associated with changes in local air quality (including dust). An assessment of air quality impacts is provided in ES Chapter 9: *Air Quality*, and assessed to air quality objectives protective of health. The results of this assessments and the associated impact on health and wellbeing are further discussed in Section 0~~7~~ of this briefing note (Health Appraisal).
Stress during the pre-application process, construction and operation	It is understood that the planning application process can create stress within a community. To mitigate this, the local community have been engaged with throughout the pre-application process, to

Theme of concern	Response
	inform and refine the project, and provide information intended to respond to and address concern and anxiety.
Requests for an individual health impact assessment	As agreed, health has been fully integrated into the regulatory assessment process, and focusses on any credible precursor to an adverse health outcome. Section 07 of this briefing note (Health Appraisal) signposts as to how and where health has been assessed and addressed, and offers additional commentary to set potential risk into context, where appropriate.
Concerns that HGVs and construction vehicles will be extremely detrimental to air quality and the health of the local population, due to road traffic emissions created by these vehicles.	Air quality and transport are addressed in the respective sections of the ES, and the results of these assessments and the associated impact on health and wellbeing are discussed in Section 07 (Health Appraisal).

1.79 No additional health hazards or gaps in the assessment scope were identified, reinforcing an appropriate and robust scope and focus.

HEALTH AND WELLBEING BASELINE

Introduction

1.81 Different communities have varying susceptibility to health and wellbeing effects (both adverse and beneficial) as a result of social and demographic structure, behaviour and relative economic circumstance.

1.82 Please note that this health baseline compliments those contained within each of the overlapping technical disciplines protective of health, including their identification of topic specific sensitive receptors.

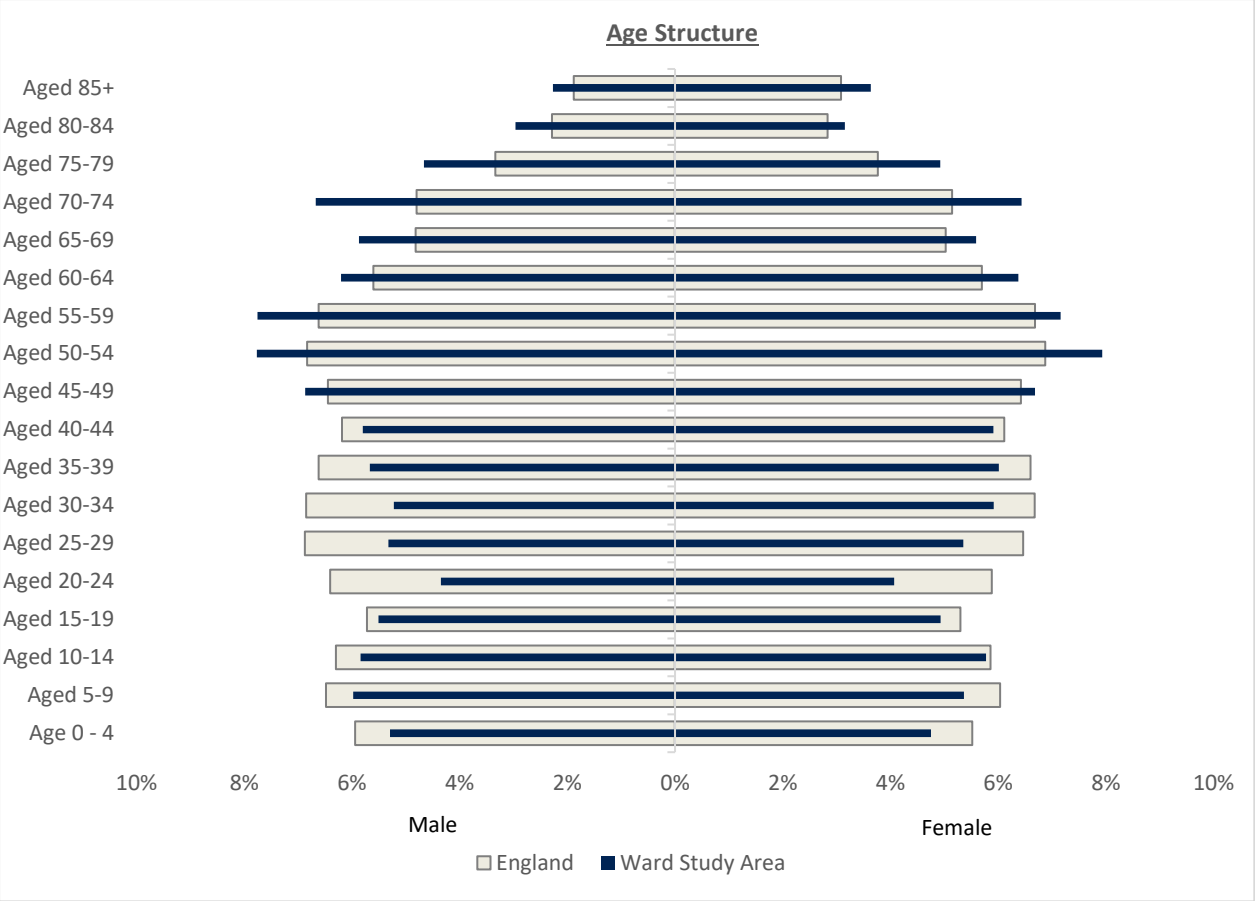
1.83 As noted in ES Chapter 2: *Site Description*, the closest settlements to the Main HNRFI Site are the village of Elmesthorpe along the B581 Station Road to the north and a mobile home park and a separate gypsy and traveller settlement off Smithy Lane to the south-west of M69 Junction 2. At a range 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.

1.84 The following information sets out the local health circumstance of the communities living within the ward study area comprising of several wards (i.e. Croft Hill; Hinckley de Montford; Burbage St Catherine's & Lash Hill; Stanton & Flamville; Barwell; Broughton Astley-Primethorpe & Sutton; Cosby with South Whetstone; Lutterworth West; Ullesthorpe; and Revel and Binley Woods) and the district study area comprising of four districts (i.e. Blaby; Hinckley & Bosworth; Harborough; and Rugby).

Demography, deprivation and socio-economic circumstance

1.85 As shown in Figure 6.1, a higher proportion of the ward study area population (both genders) are aged 45 and older when compared to the England average. Within the ward study area, 25.9% of the population is 24 years and younger compared to 29.7% of the national population being in the same age group. The percent of population aged 65 years and over in the ward study area is 4.6% higher than the England average (23.1% and 18.5%, respectively).

Figure 6.1: Age structure – ward study area



1.86 As shown in Table 6.1, the percentage of the population experiencing income deprivation, child poverty deprivation and older people in deprivation within the ward study area is similar to, or lower than all relevant comparators. Additionally, indictors for housing and living environment (percentage of older people living alone, overcrowded houses, and households in fuel poverty) within the ward study area are lower than all relevant comparators.

1.87 Unemployment and long-term unemployment for the ward study area are lower than all relevant comparators. A detailed review of the wards within the study area indicate that long term unemployment rates (crude rate per 1,000) in two wards (Lutterworth West and Ullesthorpe with 2.5 and 2.6 per 1,000 people, respectively) are significantly worse than the national average (1.9). Additionally, long term unemployment rates in Lutterworth West and Ullesthorpe are higher than the Harborough District (0.4).

Table 6.2~~1~~: Deprivation and socio-economic circumstance statistics

Indicator	Date	Ward study area	District study area	Regional study area	England
Deprivation and socio-economic circumstance					
Income deprivation, English Indices of Deprivation (%)	2019	7.36	7.35	13.7	12.9

Indicator	Date	Ward study area	District study area	Regional study area	England
Deprivation and socio-economic circumstance					
Child poverty, English Indices of Deprivation (%)	2019	9.64	9.5	18.5	17.1
Older people in deprivation, English Indices of Deprivation (%)	2019	8.43	8.8	14.4	14.2
Older people living alone (%)	2011	27.15	28.5	30.4	31.5
Overcrowded houses (%)	2011	2.54	3.6	6.2	8.7
Fuel poverty (%)	2020	10.7	11.2	16	13.2
Unemployment (%)	2021-2022	2.93	3	5.01	5
Long term unemployment (Crude rate per 1,000)	2021-2022	1.25	0.5	2.3	1.9
Key:					
	Better than the England average				
	Worse than the England average				

Source: OHID Local Health (OHID, n.d.)

Life expectancy and physical health

1.88 As shown in Table 6.2, life expectancy at birth for males in the ward study area is higher than all relevant comparators. Life expectancy at birth for females in the ward study area is marginally higher than the national average and lower than the district study area and regional study area. A review of the wards individually indicate that life expectancy for females in Barwell ward within Hinckley and Bosworth district is significantly worse than the national average (81.2 years and 83.2 years, respectively). However, healthy life expectancy (i.e. the number of years spent in good health) in Barwell ward is similar to the national average. Overall, the most recent statistics for healthy life expectancy for both males and females in the ward study area is higher than all relevant comparators.

1.89 Within the ward study area, emergency hospital admissions for all causes are lower than the national average. While this is the case, when analysing specific underlying causes, emergency hospital admissions in the ward study area are lower than all relevant comparators for the following: coronary heart disease, myocardial infarction and chronic obstructive pulmonary disease. Emergency hospital admissions relating to stroke within the ward study area is higher than all relevant comparators. In the absence of emergency hospital admissions data for cancer, statistics relating to incidence have been collected and show that cancer incidence in the ward study area is marginally lower than regional and national comparators. Emergency hospital admissions for hip fracture in 65 year olds and older are higher than all comparators within the ward study area. Specifically, the following wards are significantly worse than the national average for emergency hospital admissions for hip fractures in 65+: Hinckley de Montfort, Burbage St Catherines and Lash Hill, Barwell, and Broughton Astley-Primethorpe & Sutton.

1.90 Mortality from all causes within the ward study area is lower than the regional study average and national average, but higher than the district study area. One of the 10

wards comprising the ward study area was identified to be significantly worse than the national average for deaths from all causes (Barwell ward). When considering the specific underlying causes analysed, mortality from cancer, circulatory disease, coronary heart disease, stroke, and respiratory diseases are lower than the regional study average and the national average.

1.91 Mortality from all causes considered preventable (for the population <75 years old) are lower than the regional study average and the national average.

Table 6.~~32~~: Life expectancy and physical health statistics

Indicator	Date	Ward study area	District study area	Regional study area	England
Life expectancy					
Life expectancy at birth for males	2016 to 2020	81.4	80.8	78.9	79.5
Life expectancy at birth for females	2016 to 2020	83.7	84.3	82.6	83.2
Healthy life expectancy for males	2009 to 2013; 2012 to 2014	65.2	n/a	62.6	63.4
Healthy life expectancy for females	2009 to 2013; 2012 to 2014	67.5	n/a	63	64
Hospital admissions/disease incidence					
Emergency hospital admissions for all causes (SAR)	2015-16 to 2019-20	91.41	89.8	102.7	100
Emergency hospital admissions for coronary heart disease (SAR)	2015-16 to 2019-20	80.44	73.6	99.3	100
Emergency hospital admissions for stroke (SAR)	2015-16 to 2019-20	103.75	95.6	98.7	100
Emergency hospital admissions for myocardial infarction (SAR)	2015-16 to 2019-20	88.5	82.2	100.1	100
Emergency hospital admissions for chronic obstructive pulmonary disease (SAR)	2015-16 to 2019-20	85.0	76.2	107.0	100
Incidence of all cancer (SIR)	2015 to 2019	97.9	96.8	98.8	100
Emergency hospital admissions for hip fracture in 65+ (SAR)	2016-2017 to 2020-2021	129.1	115.2	105.9	100
Mortality					
Deaths from all causes (SMR)	2016-2020	94.7	91.5	104.1	100

Indicator	Date	Ward study area	District study area	Regional study area	England
Deaths from cancer (SMR)	2016-2020	98.9	95.9	102.7	100
Deaths from circulatory disease (SMR)	2016-2020	90.2	89.4	103.9	100
Deaths from coronary heart disease (SMR)	2016-2020	85.9	89.0	106.0	100
Deaths from stroke (SMR)	2016-2020	88.1	82.4	101.2	100
Deaths from respiratory diseases (SMR)	2016-2020	81.0	81.7	103.0	100
Deaths from all causes, under 75 years (SMR)	2016-2020	83.1	85.2	104.6	100
Deaths from all cancer, under 75 years (SMR)	2016-2020	97.9	92.7	103.1	100
Deaths from circulatory disease, under 75 years (SMR)	2016-2020	76.8	83.7	106.3	100
Deaths from causes considered preventable, under 75 years (SMR)	2016-2020	76.3	82.5	103.9	100
Key:					
	Better than the England average				
	Worse than the England average				

Source: OHID Local Health (OHID, n.d.), Office for National Statistics (Office for National Statistics, 2016; Office for National Statistics, 2016)

Mental health, lifestyle and behavioural risk factors

1.92 As shown in Table 6.3, hospital stays for self-harm within the ward study area are lower than all the relevant comparators. District-level is the lowest geography that statistics for suicide rate are available for; the rate of suicide in the district study area is lower than all comparators.

1.93 The prevalence of overweight and obese children at reception for the ward study area is higher than all comparators. Specifically, the following wards are significantly worse than the national average for the prevalence of overweight children, including obesity at reception: Hinckley de Montfort, Burbage St Catherines and Lash Hill, Stanton and Flamville, and Barwell. For severe obesity at reception, Hinckley de Montfort ward is also significantly worse than the national average.

1.94 Regarding the adult population, the percentage of adults who are classified as overweight or obese in the district study area is higher than the national average. While this is the case, the percentage of adults in the district study area who are physically active is marginally lower than the national average. Within the ward study area, regular smoking at 15 years old is lower than all relevant comparators.

Table 6.~~43~~: Mental health, lifestyle and behavioural risk factor baseline statistics

Indicator	Date	Ward study area	District study area	Regional study area	England
Mental health					
Hospital stays for self-harm (SAR)	2016-2017 to 2020-2021	68.7	77.7	102.4	100.0
Suicide rate (per 100,000 population)	2018-20	n/a	8.8	10.2	10.4
Lifestyle and behavioural risk factors					
Prevalence of overweight children, including obesity (Reception) (%)	2017-18 to 2019-20	25.2	21.9	23.2	22.6
Prevalence of obesity, including severe obesity (Reception) (%)	2017-18 to 2019-20	7.9	8.5	10.0	9.7
Prevalence of overweight children, including obesity (Year 6) (%)	2017-18 to 2019-20	30.1	30.6	35.6	34.6
Prevalence of obesity, including severe obesity (Year 6) (%)	2017-18 to 2019-20	15.8	17.0	21.2	20.4
Smoking prevalence at 15 years (regular) (%)	2014	4.8	4.9	5.1	5.4
Hospital stays for alcohol-related harm, narrow definition (old method) (per 100,000 population)	2018/19	n/a	621.5	719.5	664.0
Percentage of adults classified as overweight or obese	2020-2021	n/a	67.0	66.7	63.5
Percentage of physically active adults	2020-2021	n/a	65.7	63.8	65.9
Key:					
	Better than the England average				
	Worse than the England average				

Source: OHID Local Health (OHID, n.d.), OHID Fingertips (OHID, n.d.)

Conclusion

1.95 Overall, the population living within the local study area is more senior when compared to national averages.

1.96 Indicators relating to socio-economic circumstance show that generally, the population living within the local study area show lower levels of deprivation when compared to the national average. Although there are specific wards noted to be significantly worse than national unemployment and long-term unemployment rates, the rates in the overall ward study area remains low across the district.

1.97 The indicators analysed which relate to physical health show that the overall burden of

poor health is low. Life expectancy for males and females in the ward study area is higher than the district study area, regional study area and the national averages. The ward study area has an aging population and relatable hip fractures within the ward study area are higher than the national average.

1.98 Mental wellbeing in the study area appears to be strong as the hospital stays for self-harm are similar to or significantly lower than the national average in all wards. Data on suicide rate is only available at the district level; this shows that suicide rate at the district level is better than the national average.

1.99 Data relating to behavioural risk factors shows that the prevalence of overweight and obese children and adults in the district is high at reception. However, data for adults is not available at the ward level and so it is difficult to ascertain whether or not this is representative across the ward study area. The ward-specific data for prevalence of overweight and obese children at reception shows a disparity across the wards, where 4 wards have significantly higher prevalence of obesity in children and others are similar and/or better than the national average.

1.100 Overall, it is considered that the population living within the local study are not particularly sensitive to environmental changes associated with the HNRFI, but sensitive to socio-economic opportunities, particularly employment. While this does not exclude the probability that there will be some individuals or groups of people who do not conform to the overall profile. This data has since been further corroborated within the Local Impact Reports sharing sections of the recent Joint Strategic Health Needs Assessment.

HEALTH APPRAISAL

Overview

1.101 The following appraisal is intended to collate, signpost and further communicate the coverage of health within the technical assessments of the ES.

1.102 Significance criteria (a regulatory requirement of the planning process not required in HIA) are covered within each of the technical discipline methodology sections of the ES, outlining the discipline specific criteria and assumptions applied (including receptor sensitivity to the pertinent health pathway and magnitude of change).

Health impacts from changes in air quality

Context

1.103 The air quality health evidence base is substantial, with extensive epidemiological research on a wide array of emissions, forming the basis to air quality objectives applied in EIA and protective of health. The Committee on the Medical Effects of Air Pollutants (COMEAP) has published several reports concerning the health effects of air pollutants, including topics such as air pollution and mortality, cardiovascular disease, and more recently the possible links between air pollution and a decline in mental ability and dementia in older people (COMEAP, n.d.).

Assessment

Construction

1.104 As stated in ES Chapter 9: *Air Quality*, the maximum change in annual mean concentrations of pollutants due to the presence of construction traffic is predicted to be <+0.01 $\mu g.m^{-3}$ for NO_2, PM_{10} and $PM_{2.5}$ at any receptor.

1.105 When considering the quantitative exposure response assessment health evidence base collated by COMEAP, the relative change in emission concentration and community exposure remains orders of magnitude lower than is required to quantify any measurable adverse health outcome on any local community or receptor. Furthermore, the predicted environmental concentrations for all pollutants would remain below the air quality objective threshold protective of the environment and human health.

1.106 On this basis, as detailed in the ES, and supported by the health evidence base, the predicted change in annual mean concentrations of NO_2, PM_{10} and $PM_{2.5}$ due to the presence of construction activities and traffic would not be sufficient to quantify any adverse change in local population health outcome.

Operation

1.107 Once operational, long-term changes in local air quality have been assessed at existing human receptor locations for the opening year (2026) and the future year (2036).

1.108 As stated in ES Chapter 9: *Air Quality*, the results indicate that changes in air quality would remain well within all air quality objectives protective of health. On this basis, it was not considered necessary to undertake a detailed assessment as per DMRB LA105.

1.109 The Health and Equality Briefing Note further tested this, where following a review of the air quality modelling results, during the opening year (2026), the average change in annual mean concentrations across all districts analysed would be:

- +0.08 $\mu g.m^{-3}$ for NO_2;
- +0.06 $\mu g.m^{-3}$ for PM_{10}; and
- -0.16 $\mu g.m^{-3}$ for $PM_{2.5}$.

1.110 During the future year (2036), the average change in annual mean concentrations across all districts analysed would be:

- +0.02 $\mu g.m^{-3}$ for NO_2;
- +0.02 $\mu g.m^{-3}$ for PM_{10}; and
- +0.01 $\mu g.m^{-3}$ for $PM_{2.5}$.

1.111 These average changes in concentration are considered to be negligible in air quality terms and the relative change in concentration and exposure remains order of magnitude lower than is required to quantify any measurable adverse health outcome on local communities. To set this into context, even when assuming an unlikely hypothetical situation, where thousands or people reside in a single household subject to the highest change with the highest burden of poor health as a constant, it is still not possible to quantify any change in health outcome through the risk ratios defined by COMEAP.

Conclusion

1.112 Changes in air quality would remain well within all air quality objectives protective of the environment and health, and the average change in concentration for all pollutants during construction and operation do not present any measurable risk to public health.

Health impacts from changes in noise exposure

Context

1.113 The relationship between noise and health outcomes is complex, with both auditory and non-auditory outcomes that vary by noise source, receptor, and can be further influenced/confounded by other sensory inputs and even individual attitudes to noise.

1.114 In this instance, operation of the HNRFI does not present any potential for an auditory health outcome (i.e. the change in noise level does not constitute a magnitude or duration sufficient to cause any physical damage to the hearing organelles).

1.115 Non-auditory health outcomes include the potential to impact health via annoyance and/or sleep disturbance. As identified in ES Chapter 10: *Noise and Vibration*, the nearest noise sensitive receptors to the Main HNRFI Site are directly adjacent to the Site boundary. In total, 28 noise sensitive receptors have been considered, extending up to 515 m from the site boundary.

Assessment

Construction activities

1.116 As stated in ES Chapter 10: *Noise and Vibration*, activities taking place during the following phases of construction have the potential to generate noise:

- Phase 1: site preparation works including demolition, earthworks;
- Phase 2: foundation works involving concreting plant, trucks and lorries;
- Phase 3: building erection works involving lorries, tracked cranes and hand-held tools; and
- Phase 4: road surfacing including asphalt paving equipment and lorries.

1.117 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.

1.118 As stated in ES Chapter 10: *Noise and Vibration*, 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. This is on the basis that construction activities would only be concentrated in one location for a specific period of time, rather than for the entire duration of the construction phase.

1.119 For most receptors, for the average case scenarios, the noise levels are predicted to be below the criterion of 65dB, resulting in a temporary and minor change in noise exposure. Prior to mitigation, Receptor 1 (Bridge Farm, located within the site boundary) is the only receptor which would experience an exceedance of the 65dB criterion, resulting in a temporary and moderate change in noise exposure. This does not however, represent a significant risk to health, with effects limited to temporary annoyance prior to mitigation.

Construction traffic

1.120 As stated in ES Chapter 10: *Noise and Vibration*, for all road links assessed in the peak construction year of 2026, the predicted increase is up to +0.6dB during the daytime,

which is considered to be negligible in noise terms.

1.121 This temporary change in noise exposure is below what is considered to be perceptible, and does not present a risk to health.

Operation

1.122 As stated in ES Chapter 10: *Noise and Vibration*, there is potential for noise impacts during operation from the following activities:

- noise from HGV movements, loading/unloading operations, lorry park and service yard areas, including SRFI operations;
- noise from fixed plant and equipment on the HNRFI, including the proposed energy centre;
- noise from proposed off-site rail movements; and
- noise from road traffic once the development is operational, including noise from the proposed A47 link road.

1.123 On the basis that the site will operate for a 24-hour period, there is potential for health and wellbeing impacts associated with changes in noise exposure during the day (0700-2300) and night time (2300-0700) periods.

1.124 The following mitigation measures would be implemented to reduce the likely perception of impulsive noise at noise sensitive receptors:

- 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.

1.125 With the implementation of the above mitigation measures, the increase in noise levels for the daytime period on a weekday is predicted to be between +0.1dB and +0.5dB. For the night-time period, the increase also ranges between +0.1dB and +0.5dB.

1.126 The increase in noise levels for the daytime period on a weekend is predicted to be between +0.4dB and +1.5dB. For the night-time period, the increase ranges between +0.5dB and +1.7dB.

1.127 As outlined in ES Chapter 10: *Noise and Vibration*, this level of change is considered marginal, and typically imperceptible to the human ear (with changes of 3dB only just perceptible under normal conditions). As a result, the change in noise exposure associated with the operation of the SRFI is below what is regarded as perceptible and further mitigated to preclude any adverse health outcome (hypertension, sleep disturbance cardiovascular effects etc).

Conclusion

1.128 Overall, the temporary changes in noise during the construction phase and negligible changes in noise during operation would not result in any adverse health outcome.

Health impacts from changes in transport nature and flow rate

Context

1.129 Relevant health determinants associated with changes in transport nature and flow rate include: severance, pedestrian delay and amenity; cyclist delay and amenity; fear and intimidation; and accidents and safety.

1.130 As stated in ES Chapter 8: *Transport and Traffic*, a construction assessment has not been undertaken on the basis that the magnitude of change during operation would be higher. As such, the operational phase assessment is considered representative of a worst-case scenario.

Assessment

Severance

1.131 Potential severance effects on the local community, is the perception that a community is severed when it becomes separated by a major traffic route. As detailed in ES Chapter 8: *Transport and Traffic*, in general terms, according to the IEMA guidelines,

- up to a 30% change in traffic flow is likely to produce a 'slight' change in severance;
- up to a 60% change in traffic flow is likely to produce a 'moderate' change in severance; and
- up to a 90% change in traffic flow is likely to produce a 'substantial' change in severance.

1.132 As shown in ES Chapter 8: *Transport and Traffic*, prior to mitigation, a total of 101 road links would experience a 30% change in traffic flows (either total vehicles or HGVs) when comparing the 2036 'without development' scenario with the 2036 'with development' scenario. However, after considering the magnitude of change together with sensitivity classifications for each road link, severance effects only apply to the following six road links:

- Stoneygate Drive;
- A563 Asquith Way;
- Hickley Rd East of M69 J2;
- B4669 Leicester Road;

- Long Street, Stoney Stanton; and
- Barwell Lane.

1.133 Overall, as stated in in ES Chapter 8: *Transport and Traffic*, with proposed mitigation improvements in place (i.e. highways improvements) the HNRFI is considered to have an long-term minor adverse effect on severance in traffic terms. This is on the basis that traffic from the HNRFI Site would be distributed along major roads which already accommodate heavy traffic, such as the M69 motorway, where severance already exists. Furthermore, 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.

Pedestrian/cyclist delay and amenity

1.134 The delay incurred by pedestrians is generally a direct consequence of their ability to cross the roads. Therefore, 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.

1.135 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. Guidance 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 pedestrians, ES Chapter 8: *Transport and Traffic* considers other non-motorised users, including cyclists and equestrians, based on a similar methodology.

1.136 As outlined in ES Chapter 8: *Transport and Traffic*, the forecasted increased traffic on the road network would likely increase pedestrian delay/reduce pedestrian amenity at some locations, although this would generally be negligible and offset by the moderate beneficial (significant) effects associated with the proposed improved opportunities to cross the major roads around the HNRFI Site on the following links:

- B4669 Leicester Road Sapcote;
- Stanton Lane; and
- A447 Ashby Road.

1.137 Similarly, the forecasted increased traffic on the road network would likely increase cyclist delay/reduce cyclist amenity at some locations, although this would generally be negligible. The following road link would experience a minor beneficial (not significant) effect:

- B4114 Leicester Road – A47 Link Road

1.138 Overall, as stated in in ES Chapter 8: *Transport and Traffic*, with the proposed improvements in place (i.e. improved opportunities to cross the major roads around the

HNRFI Site) the HNRFI is considered to have an long-term minor adverse effect (not significant) on pedestrian delay in traffic terms. Similarly, with the pedestrian and cycling facilities proposed, the HNRFI is considered to have a direct impact of long-term negligible to minor adverse significance (not significant) on non-motorised users' (pedestrian and cyclist) amenity.

Fear and intimidation

1.139 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.

1.140 Impacts associated with the HNRFI above future baseline conditions are generally minimal, with minor adverse effects recorded on the following road links:

- B4669 Hinckley Road East of Junction 2 M69;
- B4669 Hinckley Road East of Stanton Lane;
- Long Street; and
- A563 Asquith Way.

1.141 Overall, given the location at the edge of town and taking into consideration the proposed pedestrian, cycling and equestrian improvement measures, the HNRFI is considered to have long-term negligible to minor adverse effects (not significant) on fear and intimidation.

Accidents and safety

1.142 Of the 23 road links analysed for accidents and road safety impacts, a total of 14 would experience no change in annual accidents (i.e. a negligible impact) when comparing the 2036 'with HNRFI' and 'without HNRFI' scenarios. Three road links would experience minor beneficial impacts, whereby there would be a reduction in annual accidents from the 'without HNRFI' to the 'with HNRFI' scenario. Six road links would experience minor adverse impacts, whereby there would be a reduction in annual accidents from the 'without HNRFI' to the 'with HNRFI' scenario.

Conclusion

1.143 Overall, ES Chapter 8: *Transport and Traffic* does not identify any significant adverse effects (in traffic terms) from severance, pedestrian/cyclist delay and amenity, fear and intimidation, or accidents and safety. Some significant benefits associated with pedestrian/cyclist delay and amenity have been identified, associated with the proposed improved opportunities to cross the major roads around the HNRFI Site.

1.144 On the basis that no significant adverse effects have been identified from a traffic perspective, there is no potential for adverse health effects associated with the operation of the HNRFI. While some significant beneficial effects have been identified

from a traffic perspective relating to pedestrian delay/amenity, these would occur on only a small number or road links. Overall, the significant benefits reported in ES Chapter 8: *Transport and Traffic* are not considered to result in any significant health benefits on the basis that such benefits are unlikely to contribute to a widespread uptake in physical activity.

Health impacts from changes in socio-economic factors

Context

1.145 Amongst a range of other socio-economic factors, ES Chapter 7: *Land Use and Socio-economic Effects* assesses employment and Gross Value Added (GVA)[1] during the construction and operational phases, which are considered relevant to health and wellbeing, and are discussed in further detail below.

1.146 As detailed in ES Chapter 7: *Land Use and Socio-economic Effects*, effects that are moderate or major are considered to be significant.

Assessment

Construction employment

1.147 As stated in ES Chapter 7: *Land Use and Socio-economic Effects*, over the 10 year construction period, an average of 461 full-time equivalent (FTE) workers would be required on-site per annum.

1.148 Baseline research showed that there are more residents employed in the construction sector than there are jobs; indicating the study area is a net exporter of construction workers. As such, the HNRFI will play a small role in ensuring a closer match between job opportunities and local labour.

1.149 In addition, further indirect jobs would be supported locally in suppliers of construction materials and equipment and local businesses would also benefit to some extent from temporary increases in expenditure as a result of construction workers spending their wages in local shops, accommodation and other facilities (i.e. induced effects). Accounting for positive multiplier effects and discounting for potential adverse displacement effects results in an estimate of an additional 275 FTE jobs created off-site per annum.

1.150 Overall, jobs provided during the construction phase would be short to medium term opportunities. The predicted increase in direct and indirect employment associated with construction of the HNRFI is considered to be minor beneficial in socio-economic terms. In a health and wellbeing context, the increase in employment generation during the construction phase would have benefits at the individual level but are not anticipated to materially change population health outcomes. On this basis, the resultant health and wellbeing impact is not anticipated to be significant.

[1] GVA – the measure of the value of goods and services produced in an area, industry or sector of an economy.

Operational employment

1.151 ES Chapter 7: *Land Use and Socio-economic Effects* outlines a 'reference case', which relates to the existing levels of employment on-site (currently in agricultural use), which is considered to be negligible in the context of the HNRFI. The expectation is that the agricultural businesses that currently exist would continue into the future in the absence of the HNRFI.

1.152 Accounting for vacancy levels, the HNRFI is expected to require 8,400 – 10,400 FTE workers once fully occupied. 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. However, displacement of jobs could occur where the proposed activity could displace another activity in the target area (thereby reducing its additionality). 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.

1.153 It is predicted that between 2,100 and 2,600 jobs would be safeguarded (or displaced), leaving 6,300 – 7,800 on-site jobs being considered net additional. A further 2,000 to 2,500 off-site jobs would be induced by operational on-site employment.

1.154 Therefore, overall, accounting for leakage, displacement and multiplier effects, a total of 10,400-12,900 jobs are considered to be net additional.

1.155 Overall, the net additional jobs provided during the operational phase would be long-term in nature. In addition the HNRFI contributes to job retention. The predicted increase in direct and indirect employment associated with operation of the HNRFI is considered to be moderate (significant) beneficial in socio-economic terms. In a health and wellbeing context, the increase in employment generation during the operation phase would have benefits at the population level and is therefore considered to be significant.

Operational GVA

1.156 As stated in ES Chapter 7: *Land Use and Socio-economic Effects*, the ONS estimates that each transport and distribution (B8) worker generates a GVA of £39,135 per FTE employee per annum.

1.157 Overall, the addition of between 8,400 – 10,400 on-site jobs would generate an estimated £329 - £406 million per annum. Of this:

- £247 to £305 million GVA per annum would go to the to the LLEP economy (associated with the 6,300 – 7,800 net additional jobs provided on-site); and
- £82 to £102 million per annum would be safeguarded by re-allocating existing logistics jobs to a more optimal location.

Conclusion

1.158 From a health perspective, income and employment are key wider determinants of health, influencing a range of factors which are conducive to good health and wellbeing such as how and where people live, the resources and amenities they have to support and inform positive behaviours and good health, and generational factors that underpin socio-economic circumstance and associated health inequality.

1.159 The HNRFI would provide significant socio-economic benefits during operation within areas exhibiting high levels of long-term unemployment (Lutterworth West and Ullesthorpe), which would support the local economy and increase economic resilience during a time of socio-economic uncertainty.

1.160 The resultant health effect would be significant on the basis that it is anticipated that the economic benefits associated with the HNRFI would influence prosperity at the population level.

Health impacts from construction workforce

Context

1.161 Where there is no mitigation in place to internalise potential impacts, an influx of a temporary non-home-based construction workforce is likely to increase demand for local services and amenities. Of specific relevance to health, are primary and secondary healthcare facilities and services. Where an increase in demand for such services causes an exceedance in service capacity, this can lead to a reduction in service quality.

Assessment

1.162 As detailed in ES Chapter 7: *Land Use and Socio-economic effects,* according to the APS in March 2022 there were 52,300 residents in the construction study area employed in construction, and approximately 51,700 construction employees that work in the study area. The comparison of the number of residents working in the construction sector and the number of jobs in the same sector for the construction study area shows a net export of jobs. Therefore the addition of 740 net additional construction jobs will likely be met by the local workforce.

1.163 On the basis that construction jobs associated with the proposed development are likely to be met by individuals looking for work in the study area (rather than having to commute, as the baseline statistics show is the case now), the potential impact on local services and amenities is not anticipated to be significant as these individuals already live in and are accounted for in local NHS budget allocations.

Conclusion

1.164 Overall, on the basis that the local workforce can meet the demand for jobs required during the construction phase, the resultant health effect would not be significant.

Health impacts from changes in surface water and flood risk

Context

1.165 ES Chapter 14: *Surface Water and Flood Risk*, considers the impact of the HNRFI on flood risk, surface water quantity, surface water quality, foul water sewerage capacity and potable water supply (i.e. from groundwater abstraction).

1.166 As detailed in ES Chapter 14: *Surface Water and Flood Risk*, effects determined to be moderate or greater are considered significant.

Assessment

Construction

1.167 As detailed in ES Chapter 14: *Surface Water and Flood Risk*, the majority of the DCO Site is located within Flood Zone 1, with some small areas of the Main HNRFI Site and offsite highway work 'B6' within Flood Zone 2 and 3. However, the CEMP sets out methodologies and monitoring requirements to prevent adverse effects on surface water (quality and quantity) and flood risk. Similarly, the surface water drainage strategy would ensure surface water would 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. Overall, following implementation of the CEMP and surface water drainage strategy, the residual effect during the construction phase would be negligible and not significant.

1.168 In terms of foul water management, there would be increased pressure on the local foul water network due to the temporary presence of construction workers and associated welfare facilities. However, assuming welfare facilities are appropriately installed and managed at the DCO Site, the residual effect during the construction phase would be negligible and not significant.

1.169 Similarly, there would be an increased demand on the local water supply due to construction activities and the presence of construction workers. There are services to existing properties within the Main HNRFI Site which could be re-purposed to provide connections for the construction accommodation and activities in advance of bringing the main connection to site. If necessary, on-site storage can be utilised during the construction period to minimise any short-term connections that may otherwise be necessary. Overall, the demand placed upon the water supply network for the construction period is considered to have a negligible effect, which is not significant.

Operation

1.170 As detailed in ES Chapter 14: *Surface Water and Flood Risk*, the HNRFI includes the reprofiling of the Main HNRFI Site to form two plateaux, which requires the realignment of an Unnamed Ordinary Watercourse (UOW) to flow along the south-eastern boundary within a new channel, which currently passes through the Main HNRFI Site. The realigned watercourse would flow along a corridor that would be designed to contain the necessary flood flows; and includes an allowance for future climate change. Routine inspection, maintenance, and remedial actions would ensure the long-term performance of the watercourse and culverts.

1.171 In addition, the A47 Link Road crosses a number of small watercourses. To protect against potential flood risk, the road would be elevated upon an embankment above the floodplain and culverts would be provided beneath the road to preserve hydraulic connectivity and convey flood flows into the downstream channels.

1.172 Overall, flood risk on occupants and users of the Main HNRFI Site is considered to be negligible. Furthermore, it is stated that no land outside the Main HNRFI Site would be at an increased risk of fluvial and surface water flooding.

1.173 In terms of surface water quantity, the Main HNRFI Site and the A47 Link Road would introduce a significant area of impermeable surfaces onto a currently greenfield area, which has the potential to increase surface water runoff through reduced infiltration which would increase discharge into receiving watercourses. The offsite highway and railway works might necessitate a small increase in impermeable area, but 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 a major impact. To manage surface water quantity, an appropriate drainage strategy including SuDS has been established to reduce surface water runoff rates and direct any pluvial flow paths towards a positive drainage system.

1.174 As a consequence, the HNRFI would provide a betterment in regard to water quantity control, particularly for the higher return period events (e.g. storm events of heavy rainfall).

1.175 Contamination of surface water during the operational phase, and potential impacts on its quality, is most likely to be caused by pollutants associated with vehicle usage. However, the facilities management team would clean and maintain proposed oil interceptors which would mitigate against the potential impact of contaminated surface runoff entering the drainage system. Overall, the change of use of the Main HNRFI Site would be of benefit due to reduced farming activities which are currently pollute the Thurlaston Brook and Soar Brook catchments.

1.176 There would be increased foul water flows to the local sewerage network associated with the HNRFI, and network upgrades would be required to ensure sufficient capacity. Following these upgrades, the impact is considered negligible and not significant.

1.177 Regarding potable water supply, there would be an increase in water demand as a result of the HNRFI. However, the increase in demand is considered to be negligible and the water supply network is not considered sensitive to change. As a result, the effect is considered to be negligible and not significant.

Conclusion

1.178 Overall, following the implementation of mitigation measures, the potential effects on surface water and flood risk during construction and operation of the HNRFI would not be significant, whereby the resultant effect on health would also be not significant.

Health impact from changes in visual amenity (including light)

Context

1.179 Of relevance to this report, ES Chapter 11: *Landscape and Visual Effects* assesses visual impacts, which relate to the appearance of such changes within views from residential and recreation receptors (e.g. PRoW) and how this affects visual amenity. The assessment considers impacts on visual amenity during the day and night time periods, with the night time assessment focussing on how light from the HNRFI may have an impact.

1.180 Changes in visual amenity have the potential to deter use of specific areas for participation in physical activity and recreation. However, provided that reasonable and accessible alternative resources for physical activity and recreation exist in the local area, there is limited potential to influence health and wellbeing.

1.181 As detailed in ES Chapter 11: *Landscape and Visual Effects*, effects identified at a substantial, major, major/moderate or moderate level 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.

Assessment

Construction (day)

1.182 As stated in ES Chapter 11: *Landscape and Visual Effects*, 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. However, the duration of these changes would be temporary in nature and restricted by the phased nature of the HNRFI.

1.183 In general, the potential visual effects during the construction phase would be difficult to mitigate entirely due to the nature of these operations. However, best practice construction methods will aid in reducing the perception of construction activities for those receptors most likely to be affected. Whilst visual impacts at some receptors would reduce to a somewhat as a result of the mitigation measures proposed, no receptor experiencing a significant unmitigated effect would experience a reduction to a non-significant level of effect as a result of construction mitigation.

1.184 Overall, while some significant changes to visual amenity would be experienced, these impacts would be temporary and transient in nature. Furthermore, reasonable and accessible alternative resources for physical activity and recreation exist in the local area. As such, the impact on health and wellbeing would not be significant.

Construction (night)

1.185 As detailed in the Lighting Strategy (document reference 6.2.3.2), where work is required outside of daylight hours, temporary lighting will operate in all external areas used by construction workers after dark in order to provide a safe and secure working environment.

1.186 Specifically, high quality LED light sources with high colour rendering index shall be utilised to maximise visibility with efficient light output. Furthermore, luminaires shall be mounted at the lowest practical mounting height, providing lighting only where lighting is required.

1.187 Overall, lighting shall be provided to meet the target lux level as set out in BS 12464-2 Lighting of Outdoor Workplaces without over lighting. Furthermore, the use of construction phase lighting will be short term and reversible.

1.188 Specifically, as detailed in Appendix 11.5: *Schedule of Landscape and Visual Construction Effects*, while visual impacts associated with temporary construction lighting would occur at nine receptors, these receptors comprise PRoWs, roads, a field and a church. No residential receptors would be impacted by temporary construction lighting. On the basis that the receptors affected are not considered particularly sensitive from a health and wellbeing context, the impact on health and wellbeing would not be significant.

Operation (day)

1.189 ES Chapter 11: *Landscape and Visual Effects* considers visual impacts when the HNRFI is fully operational (Year 1) and all construction phases have ceased, and 15 years after completion of the HNRFI (such that mitigation planting may have matured and/or materials weathered). Year 1 impacts are more considerable than those at Year 15 of operation due to the limited initial effect of the landscape proposals.

1.190 While some visual receptors would experience significant visual effects in Year 1, by Year 15 the residual effect (i.e. once mitigation planting has matured) would not be significant at the majority of receptors assessed in ES Chapter 11: *Landscape and Visual Effects*.

1.191 As per the construction phase, while some significant changes to visual amenity would be experienced at visual receptors during the day time period, reasonable and accessible alternative resources for physical activity and recreation exist in the local area. As such, the impact on health and wellbeing would not be significant.

Operation (night)

1.192 The Lighting Strategy (document reference 6.2.3.2) outlines parameters to limit obtrusive light and light pollution during operation of the Proposed Development.

1.193 Specifically, as detailed in Appendix 11.6: *Schedule of Landscape and Visual Operational Effects*, visual impacts during operation would occur at 11 receptors, these receptors comprise PRoWs, roads, a field and a church. No residential receptors would be impacted by temporary construction lighting. On the basis that the receptors affected are not considered particularly sensitive from a health and wellbeing context, the impact on health and wellbeing would not be significant.

Conclusion

1.194 Overall, the changes in visual amenity construction and operation of the HNRFI during

the day time period are not considered to be significant on the basis that reasonable and accessible alternative resources for physical activity and recreation exist in the local area.

1.195 During the night time period, any change in visual impact associated with lighting would not impact residential receptors. On this basis, there would be no material impact on health and wellbeing.

Health Impact from changes in EMF

Context

1.196 Electromagnetic fields (EMF) and the electromagnetic forces they represent are a fundamental part of the physical world. Electromagnetic forces are partly responsible for the cohesion of material substances and they mediate processes of chemistry, including those in human cells. EMFs occur naturally within the human body (through nerve and muscle activity) and also exist in the form of the magnetic field created by the earth and electric fields in the atmosphere.

1.197 Extremely Low Frequency (ELF) EMFs are part of the electromagnetic spectrum, which also encompasses radio waves, microwaves, infrared, visible light, ultraviolet, x-rays and gamma rays. At higher frequencies, electric and magnetic fields are coupled together and referred to as electromagnetic fields; as the frequency decreases, the coupling decreases, and at the 50 Hz frequency used for HVAC electricity transmission, it is appropriate to think in terms of separate electric and magnetic fields.

1.198 Unlike ionizing radiation found in the upper part of the electromagnetic spectrum (such as gamma rays emitted by radioactive materials, or x-rays), ELF EMFs cannot break the bonds that hold molecules in cells together and therefore cannot directly produce ionisation that could be directly damaging to cellular material. This is why ELF EMFs are categorised as 'non-ionising radiation'.

1.199 EMFs are strongest close to the point at which they are generated (e.g. a current-carrying conductor) and decrease rapidly in strength with distance from the source.

Electric fields

1.200 Electric fields are created in spaces between points at different voltages. Voltage (potential difference) can be described as the pressure behind the flow of electricity, analogous to the pressure of water in a hose.

1.201 The static atmospheric electric field at ground level is normally about 100 volts per metre (V.m-1) in fine weather and may rise to many thousands of volts per metre during thunderstorms. Electricity in homes is at a voltage of 230 V but outside homes it is distributed and transmitted at higher voltages, from 400 V up to 400 kV in the UK.

1.202 Generally, the higher the voltage, the greater the electric field. However, electric fields are readily screened by metals, most building materials and a degree of screening is offered by trees, hedges, and other earthed objects. This means that underground cables

do not produce an electric field above ground level due to being buried.

Magnetic fields

1.203 Magnetic fields are produced by current, which is the flow of electricity. Current can be likened to the volume of water flowing in a hose when the nozzle is open. Anything that uses or carries mains electricity is potentially a source of power frequency magnetic fields.

1.204 The strength of magnetic field from electrical equipment depends on the current carried by it, where generally, the greater the current, the greater the magnetic field. As such, magnetic fields come from a wide range of sources and vary significantly within households, workplaces and the built and natural environment.

1.205 Typical residential exposure to ELF magnetic fields is in the range of 0.01 µT (microteslas) to 0.2 µT (The Energy Networks Association, 2013) ~~(The Energy Networks Association, 2013)~~. Low-voltage distribution circuits, household wiring and electrical appliances are typically the main sources of residential exposure, although in some cases nearby high-voltage transmission can contribute to higher-than-average residential exposure (Maslanyj, Mee, & Allen, 2005). Electrical appliances can sometimes generate significant ELF magnetic fields (shown in Table 7.1), albeit in close proximity and with exposure therefore typically of a short duration.

1.206 The time-varying magnetic field from AC mains electricity is separate to the Earth's natural (static) magnetic field, which varies between about 30 µT at the equator and 65 µT in high latitudes.

Table 7.5~~1~~: Example magnetic fields from household appliances

Example magnetic fields from household appliances Appliance	Magnetic field (µT)	Distance (cm)
Hair dryer	6 – 2,000	3
Vacuum cleaner	2 – 20	30
Microwave	4 – 8	30
Dishwasher	0.6 – 3	30
Television	0.01 – 0.15	100

Source: (World Health Organisation, n.d.)

EMF Health Evidence Base

1.207 Electricity transmission and use is ubiquitous in the developed world, meaning that the entire population of a developed country such as England experiences ELF EMFs exposure in daily life. Strong ELF EMFs are known to interact with the human body, with detectible physiological effects. For these reasons, extensive scientific research has been undertaken, particularly over the last 40 years, into the potential for ELF EMFs exposure to cause adverse health effects. This research has formed the basis for health protection guidelines.

1.208 Scientific knowledge in this field is substantial, being based on a large number of

epidemiological, animal and in-vitro studies. Reviews of this evidence base have been undertaken by a number of national and international health protection bodies over the course of the last decade, to summarise the findings of published research, form conclusions and give health protection advice (where applicable) based on the weight of evidence. Possible health outcomes ranging from reproductive defects to cardiovascular and neurodegenerative diseases have been examined but have not been substantiated (McKinlay, et al., 2004; McKinlay, et al., 2004; ICNIRP, 2010; ICNIRP, 1998; SCENIHR, 2009; SCENIHR, 2013; SCENIHR, 2015) ~~(McKinlay, et al., 2004; McKinlay, et al., 2004; ICNIRP, 2010; ICNIRP, 1998; SCENIHR, 2009; SCENIHR, 2013; SCENIHR, 2015)~~.

Public Exposure Guidelines

1.209 Health protection guidelines for public and occupational exposure to ELF EMFs were published by ICNIRP in 1998 (ICNIRP, 1998) and 2010 (ICNIRP, 2010) ~~(ICNIRP, 2010)~~. These guidelines have been used in a number of sources of recommendations and advice on exposure to EMFs.

1.210 The former Department of Energy and Climate Change (DECC) published a voluntary Code of Practice (CoP) titled "Power Lines: Demonstrating compliance with EMF public exposure guidelines". This details the recommended approach for demonstrating compliance with adopted ELF EMFs exposure guidelines, subsequently updated in March 2012 (Department of Energy and Climate Change, 2012) ~~(Department of Energy and Climate Change, 2012)~~. The CoP implements the 1998 ICNIRP guidance for AC fields under the terms of the 1999 EC Recommendation, in the UK context.

1.211 The CoP specifies that compliance of overhead lines and underground cables at voltages of >132 kV should be shown by "a calculation or measurement of the maximum fields (i.e. directly under the line, or directly above the cable)". However, for all substations and for overhead lines or underground cables at ≤132 kV, the CoP states that compliance with the public exposure guidelines is assumed, based on evidence published by the Energy Networks Association (ENA) for types of infrastructure that by design are not capable of causing exceedance of the public exposure guideline limits.

1.212 The CoP specifies that assessment of EMF exposure against the general public exposure guidelines is only required in general for residential exposure or certain other cases of long-term exposure of potentially vulnerable groups (e.g. schools). The CoP states that "In other environments, where exposure can be deemed not to be for a significant period of time, the ICNIRP occupational guidelines, rather that the ICNIRP general public guidelines, shall be deemed to apply".

1.213 Table 7.2 summarises the relevant exposure guidelines. The 'basic restriction' level to protect health is for induced current in the central nervous system. The reference level for external fields indicates a threshold beyond which the potential for induced current to exceed the 'basic restriction' should be investigated. Reference levels have been published by ICNIRP and by the former HPA. They relate to the same 'basic restriction' published by ICNIRP in 1998.

Table 0.~~62~~: ELF EMFs exposure guidelines adopted in the UK

ELF EMFs exposure guidelines adopted in the UK Description		1998 ICNIRP guidelines, as adopted in the UK in the CoP	
		Occupational	**Public**
'Basic restriction' (the quantity that must not be exceeded)	**Induced current density in the central nervous system**	10 mA m-2	2 mA m-2
ICNIRP reference level (not a limit in itself but a guideline for when 'basic restriction' investigation may be required)	Magnetic field	500 µT	100 µT
	Electric field	10 kV m-1	5 kV m-1
CoP reference level (not a limit in itself but a guideline for when 'basic restriction' investigation may be required)	Magnetic field	1,800 µT	360 µT
	Electric field	46 kV m-1	9 kV m-1

Source: (Department of Energy and Climate Change, 2012; ICNIRP, 2010; ICNIRP, 1998) ~~(Department of Energy and Climate Change, 2012; ICNIRP, 2010; ICNIRP, 1998)~~

1.214 Although ICNIRP published updated guidance in 2010 (ICNIRP, 2010) ~~(ICNIRP, 2010)~~ that gives a less stringent 200 µT reference level for general public magnetic field exposure, due to changes in the basis of the basic restriction, the 1999 EC recommendation for use of the more stringent 1998 ICNIRP guidance remains the basis of UK guidance and the CoP.

Assessment

1.215 As outlined in ES Chapter 3: *Project Description*, the energy centre and renewable electrical generation component of the HNRFI would contain centralised infrastructure and plant as well as some components that will be distributed at the units.

1.216 The largest part of the energy centre would be the incoming 33 kV electricity substation and associated switchgear, which falls well below the threshold for case-by-case assessment. As detailed above, this is on the basis that the CoP states that compliance with the public exposure guidelines is assumed for all substations and for overhead lines or underground cables at ≤132 kV, based on evidence published by the ENA for types of infrastructure that by design are not capable of causing exceedance of the public exposure guideline limits.

1.217 On this basis alone, the HNRFI does not present any significant risk to neighbouring communities from changes in EMF from the generation, transmission, storage or use of electricity on site, and does not warrant any further assessment, where the worst case exposure to electric and magnetic fields would be below the CoP reference levels.

Conclusion

1.218 In conclusion, EMFs generated from the proposed electrical infrastructure required by the HNRFI would be compliant with the guideline public exposure reference levels set to protect human health. As such, the potential health impact associated with EMFs from

the HNRFI would not be significant.

EQUALITY APPRAISAL

1.219 As previously discussed, The Equality Act 2010 introduces a Public Sector Equality Duty that requires all public bodies (including planning) to play their part in making society fairer by having due regard to:

- eliminate unlawful discrimination;
- advance equality of opportunity; and
- foster good relations between people who share a protected characteristic and people who do not share it.

1.220 The HNRFI does not target or discriminate any protected characteristic, where changes directly attributable to what is proposed are a feature of proximity necessitated by the rail line. These changes have been investigated and assessed through the regulatory assessment process through the agreed scope, and each technical discipline considers the most sensitive receptors pertinent to the topic.

1.221 On the above basis, and given that the propose development would comply with all regulatory thresholds protective of the environment and health (including the most vulnerable members of our society), and does not present any measurable risk to health, due regard has been applied, the Equality Act is met, and the Public Sector Duty will be discharged through the consideration of the project during the final decision making process.

CONCLUSION

Overview

1.222 While some aspects of construction and operation of the HNRFI has the potential to influence the health and wellbeing of nearby communities, all credible health determinants have been investigated, assessed and addressed through the comprehensive DCO process.

1.223 This Health and Equality Briefing Note has been prepared with the aim of aiding transparency by signposting to, and providing additional narrative on the assessments undertaken as part of the ES to communicate potential health and wellbeing impacts (both adverse and beneficial) and respond to residual community concerns.

1.224 The following sections summarise potential distribution of health impacts, and their significance, during construction and operation of the HNRFI.

Construction

1.225 Construction of the HNRFI has the potential to influence a number of potential health determinants. For example, on-site construction activities and traffic movements to/from the construction site would result in changes to local air quality and noise exposure. However, following implementation of best practice measures and taking into consideration the magnitude and temporary/transient nature of these changes, the impact on health and wellbeing is not anticipated to be significant (i.e. the changes would not be sufficient to quantify a material change in local population health outcomes).

1.226 Similarly, application of mitigation measures detailed within a CEMP would ensure any potential impact on surface water and flood risk would be negligible, with the resultant impact on health and wellbeing not being significant.

1.227 During the construction phase, changes to the visual environment are difficult to mitigate entirely. However, best practice construction methods will aid in reducing the perception of construction activities for those receptors most likely to be affected. While changes in the visual environment may be significant, the impact on health and wellbeing would not be significant on the basis that reasonable and accessible alternative resources for physical activity and recreation exist in the local area.

1.228 The construction phase would have a beneficial impact on job and income generation, whereby in addition to providing direct on-site employment, further indirect jobs would be supported locally in suppliers of construction materials and equipment and local businesses would also benefit to some extent from temporary increases in expenditure as a result of construction workers spending their wages in local shops, accommodation and other facilities. In a health and wellbeing context, the increase in employment during construction would have benefits at the individual level but are not anticipated to materially change population health outcomes and are therefore not considered to be significant.

Operation

1.229 During operation, the predicted long-term changes in air quality and noise exposure would be minimal and would remain within objective thresholds set to be protective of the environment and human health. On this basis, the resultant impact on health and wellbeing would not be significant.

1.230 As per the construction phase, careful design and following the implementation of mitigation measures during operation would ensure any potential impact on surface water and flood risk would be negligible, with the resultant impact on health and wellbeing not being significant.

1.231 In terms of visual impacts, once mitigation planting has matured (i.e. Year 15 of operation), the residual effect would not be significant at the majority of receptors assessed. During the night time period, the level of impact from light intrusion would remain similar to the day time scenario at the receptors affected. Overall, in a health and wellbeing context, the changes in visual amenity are not considered to be significant on the basis that reasonable and accessible alternative resources for physical activity and recreation exist in the local area.

1.232 No substantial changes in operational transport nature/flow rate have been identified. On this basis, there is no potential for adverse health effects associated with the operation of the HNRFI. Some beneficial impacts are reported in relation to pedestrian delay/amenity; however, these would occur on only a small number or road links and are unlikely to contribute to a widespread uptake in physical activity.

1.233 Regarding EMF, the proposed electrical infrastructure required by the HNRFI would be compliant with the guideline public exposure reference levels set to protect human health. As such, the potential health impact associated with EMFs from the HNRFI would not be significant.

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