



Keuper Gas Storage Project

Preliminary Environmental
Information Report – Population and
Human Health

PREPARED FOR
Keuper Gas Storage
Limited

DATE
September 2025

REFERENCE
EN0310001



DOCUMENT DETAILS

DOCUMENT TITLE	Keuper Gas Storage Project
DOCUMENT SUBTITLE	Preliminary Environmental Information Report – Population and Human Health
PROJECT NUMBER	EN0310001
DATE	September 2025
VERSION	1.0
AUTHOR	ERM
CLIENT NAME	Keuper Gas Storage Limited

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ACRONYMS AND ABBREVIATIONS

Acronym	Description
ALARP	As Low As Reasonably Practicable
CDRC	Customer Data Research Centre
CEMP	Construction Environment Management Plan
DCO	Development Consent Order
DEFRA	Department for Environment Food and Rural Affairs
DWP	Department for Work and Pensions
EIA	Environmental Impact Assessment
EMF	Electromagnetic Field
ERM	Environmental Resources Management
ES	Environmental Statement
GPP	Gas Processing Plant
ISEP	Institute of Sustainability and Environmental Professionals
IMD	Index of Multiple Deprivation
JSNA	Joint Strategic Needs Assessment

Acronym	Description
KGSL	Keuper Gas Storage Limited
KGSP	Keuper Gas Storage Project
LSE	Likely Significant Effects
LSOA	Lower Super Output Areas
MC	Material Change
MHLG	Ministry of Housing, Communities and Local Government of the United Kingdom
NHS	National Health Service
NHD	Normalised Difference Vegetation Index
NPS	National Policy Statement
ONS	Office for National Statistics
PEIR	Preliminary Environmental Information Report
PHE	Public Health England
PROW	Public Right of Way
RB	Restricted Byway
WHO	World Health Organization

14. POPULATION AND HUMAN HEALTH

14.1 INTRODUCTION

14.1.1.1 This chapter of the Preliminary Environmental Information Report (PEIR) assesses the likely significant effects (LSE) of the Proposed Development with respect to population and human health.

14.1.1.2 The chapter provides:

- the policy context for population and human health;
- consultation feedback on the Proposed Development;
- the assessment methodology and criteria;
- the current baseline conditions in the defined Study Area;
- the mitigation measures the Proposed Development is committed to implementing; and
- an assessment of the likely significant effects with these measures adopted.

14.1.1.3 The assessment of population and human health is closely associated with **Chapter 13, Socio-economic Characteristics**. It also draws on the findings of other relevant assessments including:

- **Chapter 8, Air Quality;**
- **Chapter 9, Noise and Vibration;**
- **Chapter 11, Landscape and Visual Impact;**
- **Chapter 15, Major Accidents and Disasters;**
- **Chapter 16, Waste; and**
- **Chapter 17, Climate Change and GHG Emissions.**

14.2 LEGISLATION, POLICY AND GUIDANCE

14.2.1.1 The assessment considers key legislation, planning policy and guidance that are relevant to the Proposed Development and this assessment of population and human health.

14.2.1.2 Further detail regarding the planning and policy context of the Proposed Development can be found in **Chapter 5, Planning and Policy Context**.

14.2.2 LEGISLATION

14.2.2.1 This assessment is undertaken pursuant to the Environmental Impact Assessment (EIA) Directive and the continued application of EIA in the UK as set out in The Environmental Assessments and Miscellaneous Planning (Amendment) (EU Exit) Regulations 2018.

14.2.2.2 Regulation 5(2) of the Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (the 'EIA Regulations') requires the EIA process to *'identify, describe and assess in an*

appropriate manner, in light of each individual case, the direct and indirect significant effects of the proposed development on the following factors — (a) population and human health¹.

14.2.2.3 Schedule 4 of the EIA Regulations requires the Environmental Statement (ES) to contain the following:

- *'a description of the factors specified in regulation 5(2) likely to be significantly affected by the development: population, human health...'; and*
- *'a description of the likely significant effects of the development...on the factors specified in regulation 5(2)'.*

14.2.3 NATIONAL POLICY

14.2.3.1 The overarching National Policy Statement (NPS) for Energy (EN-1) sets out the national policy for energy infrastructure².

14.2.3.2 Section 4.4 concerns potential impacts on health and well-being of the population, including:

- increased traffic;
- air or water pollution;
- dust, odour;
- hazardous waste and substances;
- noise;
- exposure to radiation;
- increases in pests; and
- indirect effects associated with changes to the composition and size of the local population.

14.2.3.3 Where a proposed project has an effect on humans, the NPS states that the ES should 'assess these effects for each element of the project, identifying any potential adverse health impacts, and identifying measures to avoid, reduce or compensate for these impacts as appropriate.'

14.2.4 LOCAL PLANNING POLICY

Cheshire West and Chester Local Plan

14.2.4.1 The Cheshire West and Chester (CWAC) Local Plan was adopted in January 2015³. Policy SOC 5 of the Local Plan describes the

¹ UK Government. 2017. *Infrastructure Planning (Environmental Impact Assessment) Regulations 2017*, SI 2017/572. London: The Stationery Office.

² DESNZ (2023), *Overarching National Policy Statement for Energy (NPS EN-1)*. Available Online at: [EN1 Overarching National Policy Statement for Energy](#)

³ Cheshire West and Chester Council. 2015. *Cheshire West and Chester Local Plan*. Chester: Cheshire West and Chester Council. Available online at: [Local Plan | Cheshire West and Chester Council](#)

circumstances in which proposals will be supported. These include where proposals:

- Promote safe and accessible environments and developments with good access by walking, cycling and public transport; and
- Work to reduce poverty and deprivation across the borough, particularly in areas of identified need.

14.2.4.2 At the time of writing, CWAC is consulting on an update to the Local Plan.

Cheshire West and Chester Place Plan

14.2.4.3 The CWAC Place Plan (2021–2026) serves as the borough’s statutory Health and Wellbeing Strategy, developed by the Health and Wellbeing Board to guide local efforts in improving population health⁴.

14.2.4.4 It sets out strategic priorities focused on tackling health inequalities, improving mental and physical wellbeing, and addressing wider determinants of health. This includes wider determinants such as housing, transport, employment, and environment.

14.2.4.5 The strategy is updated annually, with recent updates in 2024 and 2025 reflecting new health data, policy shifts, and community feedback.

14.2.4.6 A key component of the plan, is the chapter titled ‘A Healthy Place to Work’, which highlights the critical link between work, economic inclusion, and health outcomes⁵.

14.2.4.7 It outlines commitments to promote fair employment, workplace wellbeing, skills development, and access to local job opportunities, particularly for vulnerable or economically inactive groups.

14.2.4.8 Both the overarching strategy and the ‘Healthy Place to Work’ pillar demonstrate a strong alignment with local planning objectives—encouraging spatial strategies that support healthy communities, reduce inequality, and integrate public health into the built environment.

14.2.5 GUIDANCE

14.2.5.1 The assessment has been undertaken in line with the following guidance:

⁴ Cheshire West and Chester Council. 2025a. *Place Plan (Health and Wellbeing Strategy) 2021–2026*. Chester: Cheshire West and Chester Council.

⁵ Cheshire West and Chester Council. 2025b. *A Healthy Place to Work (Place Plan Pillar 2)*. Chester: Cheshire West and Chester Council.

- Institute of Sustainability and Environmental Professionals (ISEP) (2022), *Guide to Effective Scoping of Human Health in Environmental Impact Assessment*⁶;
- ISEP (2022), *Guide to Determining Significance for Human Health in Environmental Impact Assessment*⁷;
- Public Health England (PHE) (2021), *Advice on the Content of Environmental Statements accompanying an application under the NSIP Regime*⁸;
- PHE (2020), *Health Impact Assessment in Spatial Planning*⁹; and
- National Health Service (NHS) London Healthy Urban Development Unit (HUDU) (2019), *Rapid Health Impact Assessment Tool*¹⁰.

14.3 CONSULTATION

14.3.1 EIA SCOPING

- 14.3.1.1 A request for a formal EIA Scoping Opinion was submitted to the Planning Inspectorate on 22 April 2025 (**Appendix 1A, EIA Scoping Report**). A Scoping Opinion from the Planning Inspectorate was received on 5 June 2025 (included as **Appendix 1B, EIA Scoping Opinion**).
- 14.3.1.2 Comments received within the Scoping Opinion which are considered relevant to population and human health are provided in **Table 14.1** below, which also sets out how and where they have been addressed in this chapter.

⁶ Institute of Sustainability and Environmental Professionals (ISEP). 2022. *Guide to Effective Scoping of Human Health in Environmental Impact Assessment*. Lincoln: ISEP.

⁷ Institute of Sustainability and Environmental Professionals (ISEP). 2022. *Guide to Determining Significance for Human Health in Environmental Impact Assessment*. Lincoln: ISEPEMA.

⁸ Public Health England. 2021. *Advice on the Content of Environmental Statements accompanying an application under the NSIP Regime*. London: Public Health England.

⁹ Public Health England. 2020. *Health Impact Assessment in Spatial Planning*. London: Public Health England.

¹⁰ NHS London Healthy Urban Development Unit (HUDU). 2019. *Rapid Health Impact Assessment Tool*. London: NHS HUDU.

TABLE 14.1 - SCOPING OPINION

Issue	Planning Inspectorate Comment	Response/Action	Reference within this document
Health related behaviours - risk taking behaviour	Given the nature of the proposed development, the Inspectorate agrees that it is unlikely to give rise to impacts on risk taking behaviour. As such, this matter can be scoped out of the assessment.	No further action, agreed that this can be scoped out of further assessment.	N/A
Health related behaviours - diet and nutrition	Given the nature of the proposed development, the Inspectorate agrees that it is unlikely to give rise to likely significant effects on diet and nutrition. As such, this matter can be scoped out of the assessment	No further action, agreed that this can be scoped out of further assessment.	N/A
Social environment – housing	The Scoping Report states that the potential for impacts on housing availability is likely to be reduced, given that the construction workforce is anticipated to be home based. On this basis, the Inspectorate agrees that the proposed development is unlikely to give rise to likely significant effects on housing availability and this matter can be scoped out of the assessment	No further action, agreed that this can be scoped out of further assessment.	N/A

Issue	Planning Inspectorate Comment	Response/Action	Reference within this document
Social environment – relocation	The Scoping Report states that relocation would not occur. On this basis, the Inspectorate agrees that this matter can be scoped out of the assessment.	No further action, agreed that this can be scoped out of further assessment.	N/A
Social environment – community identity, culture, resilience and influence	The Scoping Report states that the construction workforce is anticipated to be home based and thus the potential for impacts on community structures is reduced. On this basis, the Inspectorate agrees that the proposed development is unlikely to give rise to likely significant effects on community identity, culture, resilience and influence and as such, this matter can be scoped out of the assessment.	No further action, agreed that this can be scoped out of further assessment.	N/A
Social environment – social participation, integration and support	This matter is stated to be scoped out for the same reason as community identity, culture, resilience and influence at ID 3.10.5 above. The Inspectorate agrees that the proposed development is not likely to have a significant effect on community cohesion and this matter can be scoped out of the assessment.	No further action, agreed that this can be scoped out of further assessment.	N/A

Issue	Planning Inspectorate Comment	Response/Action	Reference within this document
Social-physical environment - water quality or availability	The Inspectorate agrees that the proposed development is unlikely to give rise to significant effects on human health as a result of water quality or availability and this matter can be scoped out of the assessment.	No further action, agreed that this can be scoped out of further assessment.	N/A
Bio-physical environment – land quality	The Inspectorate agrees that the proposed development is unlikely to give rise to significant effects on human health as a result of water quality or availability and this matter can be scoped out of the assessment.	No further action, agreed that this can be scoped out of further assessment.	N/A
Institutional and built environment - health and social care services	The Scoping Report states that these matters are not applicable to the proposed development and that impacts on health and social care services are not anticipated. Given the nature of the proposed development, the Inspectorate agrees that this matter can be scoped out of the assessment.	No further action, agreed that this can be scoped out of further assessment.	N/A
Institutional and built environment	The Scoping Report states that this matter is not applicable to the proposed development and that impacts on the built environment are not anticipated. Given the nature of the proposed development, the Inspectorate agrees	No further action, agreed that this can be scoped out of further assessment.	N/A

Issue	Planning Inspectorate Comment	Response/Action	Reference within this document
	that this matter can be scoped out of the assessment.		
Institutional and built environment – wider societal infrastructure and resources	The Scoping Report states that the construction workforce is anticipated to be homebased, and this reduces the potential for impacts on other infrastructure and resources. On this basis, the Inspectorate agrees that the proposed development is unlikely to give rise to significant effects on wider societal infrastructure and resources and this matter can be scoped out of the assessment	No further action, agreed that this can be scoped out of further assessment.	N/A
Guidance document	The Scoping Report sets out the policy and guidance documents that underpin the population and human health assessment. It is noted that Public Health England, the predecessor organisation to the UK Health Security Agency (UKHSA) and Office for Health Improvement and Disparities, produced an advice document 'Advice on the content of Environmental Statements accompanying an application under the NSIP Regime'. As this advice remains valid it should be considered within the	The PHE guidance is included in Section 14.2.5 and has informed the assessment.	Section 14.2.5

Issue	Planning Inspectorate Comment	Response/Action	Reference within this document
	ES. The applicant's attention is directed to the comments of the UKHSA at Appendix 2 to this Opinion.		
Electric and Magnetic Fields (EMF)	EMF are not mentioned within the Scoping Report, although it is noted the proposed development would include the installation of new above and/ or below ground electrical connections. The human health assessment should demonstrate how the proposed development will comply, as a minimum, with relevant EMF guidelines to demonstrate that it would not give rise to significant effects or include an assessment of effects from EMF on human health receptors, where likely significant effects could occur. The applicant's attention is directed to the comments of the UKHSA at Appendix 2 to this Opinion.	The PHE guidance is included in Section 14.2.5 and has informed the assessment. Potential sources of EMF will be confirmed and an appropriate assessment of the potential effects will be included in the ES if required.	Section 14.2.5 An assessment of potential effects from EMFs will be included in the ES if required.

14.3.2 OTHER CONSULTATION

- 14.3.2.1 No other consultation has taken place to date. Details of any further consultation relevant to population and human health will be provided in the ES.

14.4 BASIS OF THE ASSESSMENT

- 14.4.1.1 This assessment considers community health impacts during construction, operation and maintenance, and decommissioning phases of the Proposed Development. The assessment relies on data from trusted government sources and the findings of related chapters including:

- **Chapter 8, Air Quality;**
- **Chapter 9, Noise and Vibration;**
- **Chapter 11, Landscape and Visual Impact;**
- **Chapter 13, Socio-economic Characteristics;**
- **Chapter 15, Major Accidents and Disasters;**
- **Chapter 16, Waste; and**
- **Chapter 17, Climate Change and GHG Emissions.**

14.4.2 ASSESSMENT METHODOLOGY

14.4.3 SCOPE OF ASSESSMENT

- 14.4.3.1 The assessment considers the effects of the Proposed Development on population and human health during the construction, operation and maintenance, and decommissioning phases. The assessment has been undertaken within the context of the policy framework set out in **Section 14.2** and the baseline conditions described in **Section 14.5**.

- 14.4.3.2 The World Health Organisation (WHO) Constitution defines health as; 'a state of complete physical, mental and social wellbeing and not merely the absence of disease or infirmity'.

- 14.4.3.3 This assessment considers both physical and mental health determinants arising from the Proposed Development which impact community health and wellbeing. A health determinant can be any factor which has the potential to influence the health of an individual.

- 14.4.3.4 This assessment is based on the wider health determinants outlined in the ISEP 'Effective Scoping of Human Health in Environmental Impact Assessment' guidance. Within this document, health determinants have been grouped into the following five categories.

- **Health Related Behaviours:** comprising health determinants such as physical activity, risk taking behaviour and diet and nutrition;

- **Bio-physical Environment:** determinants which are part of the natural and physical characteristics and include conditions such as air quality, noise and vibration, and electric and magnetic fields;
- **Economic Environment:** the economic conditions of an area (education, employment and income), the resilience of local markets and the inherent activities and opportunities that the Proposed Development will affect;
- **Social Environment:** comprising determinants such as the social capital, social networks, norms and customs as well as key information regarding the local demographics, housing, transport and leisure assets; and
- **Institutional and Built Environment:** comprising determinants relating to the built environments, healthcare services and wider social infrastructure and resources.

14.4.4 ELEMENTS SCOPED OUT OF ASSESSMENT

- 14.4.4.1 As noted above, ISEP guidance on health assessment confirms that EIA scoping should take a 'wider determinants of health' approach.
- 14.4.4.2 **Table 14.3** lists the wider determinants that should be considered as part of the scoping process and indicates which have been scoped in and out of further assessment.
- 14.4.4.3 The ES for the Consented Development did not include a separate Population and Human Health chapter. The scope of this assessment therefore includes all aspects that have the potential to interact with human health.

TABLE 14.2 - WIDER DETERMINANTS OF HEALTH SCOPED IN AND OUT

Categories	Wider Determinants of Health	Scoped In /Out	Rationale
Health related behaviours	Physical activity	In	Scoped in as there is the potential for impacts on public rights of way (PRoW) within the Site Boundary, with potential implications for physical activity.
	Risk taking behaviour	Out	Not applicable to the Proposed Development as impacts on risk taking behaviour are not anticipated.
	Diet and nutrition	Out	Not applicable to the Proposed Development as impacts on diet and nutrition are not anticipated.
Social environment	Housing	Out	Scoped out as the construction workforce is anticipated to be largely locally based, reducing the potential for impacts on housing availability.
	Relocation	Out	Not applicable to the Proposed Development as no relocation will occur as a result.
	Open space, leisure and play	In	Scoped in as there is the potential for impacts on PRoW within the Site Boundary, with potential implications for leisure and access.
	Transport modes, access and connections	In	Scoped in as there is the potential for construction traffic to impact on travel behaviour and access to community facilities.

Categories	Wider Determinants of Health	Scoped In /Out	Rationale
	Community safety	In	Scoped in as local communities could have concerns about the real or perceived safety risks of the Proposed Development.
	Community identity, culture, resilience and influence	Out	Scoped out as the construction workforce is anticipated to be largely home-based, reducing the potential for impacts on community structures.
	Social participation, integration and support	Out	Scoped out as the construction workforce is anticipated to be largely home-based, reducing the potential for impacts on community cohesion.
Economic environment	Education and training	In	Scoped in as the Proposed Development may create opportunities for training and skills development, with potential implications for health and wellbeing.
	Employment and income	In	Scoped in as the Proposed Development will create employment opportunities, with potential effects on health and wellbeing.
Bio-Physical Environment	Climate change mitigation and adaptation	In	Scoped in as the Proposed Development, once in operation, may have an impact on population health and wellbeing through enhanced climate change mitigation and adaptation.
	Air quality	In	Scoped in as the Proposed Development may directly impact on community health through reduction in air quality. There could

Categories	Wider Determinants of Health	Scoped In /Out	Rationale
			also be community concerns around perceived impacts on air quality.
	Water quality or availability	Out	Assessed in Chapter 7: Hydrology and Flood Risk . Scoped out as effects on human health at the population level are not anticipated.
	Land quality	Out	Assessed in Chapter 6: Geology and Ground Conditions . Scoped out as effects on human health at the population level are not anticipated.
	Noise and vibration	In	Scoped in as the Proposed Development may directly impact on community health through increases in noise and vibration. There could also be community concerns around perceived impacts on noise.
	Radiation	Out	Scoped out as effects on human health at the population level are not anticipated.
	EMF	In	EMF are not included in the ISEP guidance, however, they have been scoped in to the assessment based on feedback received through the Scoping Opinion (see Table 14.1).
Institutional and built environment	Health and social care services	Out	Not applicable to the Proposed Development as impacts on health and social care services are not anticipated.

Categories	Wider Determinants of Health	Scoped In /Out	Rationale
	Built environment	Out	Not applicable to the Proposed Development as impacts on the built environment are not anticipated.
	Wider societal infrastructure and resources	Out	Scoped out as the construction workforce is anticipated to be largely home-based, reducing the potential for impacts on other infrastructure and resources.

14.4.5 STUDY AREA

- 14.4.5.1 The Proposed Development is in the Shakerley ward within the local authority area of Cheshire West and Chester. The population and human health assessment is a population-level assessment and effects are assessed at the neighbourhood level, i.e. near neighbours who are most likely to be affected.
- 14.4.5.2 The Neighbourhood Study Area is defined as the Shakerley ward. It is also informed by the Study Areas used for other relevant environmental assessment, including **Chapter 13, Socio-economic Characteristics** which assesses economic impacts such as employment and GVA effects at the local level. Population and health baseline data is provided for the Shakerley ward and benchmarked against the CWAC Local Study Area and UK national average. Where ward-level data is not available, local data is used instead.
- 14.4.5.3 The baseline refers to data provided in the baseline for **Chapter 13, Socio-economic Characteristics**, with additional data provided relating to health and relevant determinants of health as per the effects scoped into the assessment.

14.4.6 METHODOLOGY FOR THE ASSESSMENT OF EFFECTS

- 14.4.6.1 The population and health assessment is a qualitative assessment that uses professional judgement alongside published guidance, as set out in **Section 14.2.5**, to determine the following:
- the sensitivity of the receptor; and
 - the magnitude of the impact.
- 14.4.6.2 In health assessments, the receptor is generally the local population that could experience an impact. The approach to determining the sensitivity of receptors and the magnitude of impacts is set out below.

Sensitivity of Receptors

- 14.4.6.3 In determining receptor sensitivity, the assessment will consider the characteristics of the local population and the presence of groups who may be more vulnerable to health inequalities. The sensitivity of potential receptors can be described qualitatively according to the categories presented in **Table 14.3**.

TABLE 14.3 - SENSITIVITY CRITERIA

Sensitivity	Receptor
High	High levels of deprivation (including pockets of deprivation); reliance on resources shared between the population and the Proposed Development; existing wide health inequalities; people who are prevented from undertaking

Sensitivity	Receptor
	daily activities; dependents; people with very poor health status; and / or people with a very low capacity to adapt.
Medium	Moderate levels of deprivation; few alternatives to shared resources; existing widening health inequalities; people who are highly limited from undertaking daily activities; carers or people with additional support needs; people with poor health status; and / or people with a limited capacity to adapt.
Low	Low levels of deprivation; many alternatives to shared resources; narrow health inequalities; people who are slightly limited from undertaking daily activities; people providing or requiring some care; people with fair health status; and / or people with a high capacity to adapt.

Magnitude of Impacts

- 14.4.6.4 The magnitude of impacts will be determined by considering the intensity (or scale), spatial coverage and longevity of an impact. The magnitude assigned will also use professional judgement to take into consideration the application of statutory standards and non-statutory standards or guidelines. The magnitude of impact on the receptors is presented in **Table 14.4**.

TABLE 14.4 - MAGNITUDE CRITERIA

Impact Magnitude	Description
Large	High exposure or scale; long-term duration; continuous frequency; severity predominantly related to mortality or changes in morbidity (physical or mental health) for very severe illness/ injury outcomes; majority of population affected; permanent change; substantial service quality implications.
Medium	Low exposure or medium scale; medium-term duration; frequent events; severity predominantly related to moderate changes in morbidity or major change in quality-of-life; large minority of population affected; gradual reversal; small service quality implications.
Small	Very low exposure or small scale; short-term duration; occasional events; severity predominantly related to minor change in morbidity or moderate change in quality-of-life;

Impact Magnitude	Description
	small minority of population affected; rapid reversal; slight service quality implications.
Negligible	Negligible exposure or scale; very short-term duration; one-off frequency; severity predominantly relates to a minor change in quality-of-life; very few people affected; immediate reversal once activity complete; no service quality implication.

Significance of Effects

14.4.6.5 The significance of effect is determined by assessing the potential magnitude of impact on the receptors against the sensitivity of the receptor. **Table 14.5** presents the matrix showing the significance of effects. '**Moderate**' or '**Major**' effects are considered to be '**Significant**' in EIA terms.

TABLE 14.5 - SIGNIFICANCE MATRIX

Sensitivity of Receptor	Magnitude of Impact			
	Negligible	Small	Medium	Large
High	Not Significant	Moderate Adverse – Significant	Moderate Adverse – Significant	Major Adverse – Significant
Medium	Not Significant	Minor Adverse – Not Significant	Moderate Adverse – Significant	Moderate Adverse – Significant
Low	Not Significant	Not Significant	Minor Adverse – Not Significant	Minor Adverse – Not Significant

14.4.7 ADDRESSING UNCERTAINTY

14.4.7.1 As noted above, data has been collected from existing publicly available sources collected by the UK Government and related agencies. No new surveys have been conducted for this assessment. Existing government data is reliable because:

- it is mostly available and reliable at the appropriate small area level, which offers a good degree of best fit with the defined Study Area;

- it is collected and published in line with UK and EU standards and protocols for public data collection; and
- it is collected and published on a regular basis, for example, annually, biannually, or every 10 years in the case of the Census, negating the need for new data collection in future.

14.4.7.2 This PEIR includes several technical assessments which have considered the significance of effect on health-related determinants. The findings of these assessments are used to inform the community health assessment of wider effects. These assessments are included in the following chapters:

- **Chapter 8: Air Quality;**
- **Chapter 9: Noise and Vibration;**
- **Chapter 11: Landscape and Visual Impact;**
- **Chapter 13: Socio-economic Characteristics.**
- **Chapter 15: Major Accidents and Disasters;**
- **Chapter 16: Waste; and**
- **Chapter 17: Climate Change and GHG Emissions.**

14.4.7.3 Data from public sources is supplemented by the technical assessments from the above-mentioned chapters. This reduces any potential limitations associated with not conducting health-specific surveys.

14.5 BASELINE

14.5.1 BASELINE DATA SOURCES

14.5.1.1 The population and human health baseline conducted for this PEIR is a desk-based study and no baseline surveys have been undertaken at this stage. The baseline has been compiled using data from the following credible government sources:

- Census (ONS);
- Annual Population Survey (ONS);
- Annual Survey of Hours and Earnings (ONS);
- Access to Greenspace England (DEFRA);
- Access to Health Assets and Hazards Index (CDRC);
- English Indices of Deprivation (MHCLG);
- Local Health + Public Health data for small geographic areas; and
- NHS Digital.

14.5.2 EXISTING BASELINE CONDITIONS

14.5.2.1 Baseline data is presented under the following subheadings relevant to the determinants of health scoped into the assessment:

- Physical and bio-physical environment;
- Health and wellbeing;
- Economic environment; and
- Social environment.

14.5.2.2 Baseline data relevant to institutional and built environment determinants is not included because they have been scoped out of the assessment.

Physical and Bio-Physical Environment

14.5.2.3 The area surrounding the Proposed Development comprises of agricultural land-use, with scattered residential and commercial properties. There are three PROWs within the Site:

- Lach Dennis RB1;
- Lach Dennis RB6; and
- Rudheath RB7.

14.5.2.4 There are no other leisure or amenity receptors within the Site. The Dane Valley Way long distance footpath and the Cheshire Ring Canal Walk are within 3km of the Site Boundary.

14.5.2.5 Byley is the closest settlement, approximately 2 km to the north-east of the Proposed Development, with the following settlements nearby:

- Lach Dennis (2 km to the north);
- Middlewich (3 km to the south); and
- Allostock (approximately 4 km).

14.5.2.6 Communities in the area are accustomed to the existing Stublach Gas Storage Facility and Holford Gas Storage Facility, which are also located in the Shakerley ward.

14.5.2.7 However, the presence of existing industry does not prevent there being concerns over further development in the area and how this may affect local communities.

14.5.2.8 The Consumer Data Research Centre (CDRC¹¹) produces a multi-dimensional index that measure how 'healthy' neighbourhoods are. **Table 14.6** below outlines three key metrics relating to an area's physical environment.

14.5.2.9 It shows that the Shakerley ward has a better rating terms of air quality and green space than both Cheshire West and Chester, and England. However, its score against the physical environment domain is lower than the comparator areas.

¹¹ CDRC, Access to Health Assets and Hazards (AHAH). Online. Available at < [Latest version of Access to Health Assets and Hazards \(AHAH\) released - Consumer Data Research Centre](#) >

TABLE 14.6 - ACCESS TO HEALTH ASSETS AND HAZARDS (AHAH) INDEX

AHAH	Shakerley	Cheshire West and Chester	England
Air quality domain	0.18	0.23	0.26
Green space (passive)	0.56	0.49	0.42
Physical environment domain	-0.58	-0.36	0.03

Source: CDRC, 2024

14.5.2.10 The most recent Joint Strategic Needs Assessment (JSNA)¹² for Cheshire West and Chester outlines several key health metrics for the local authority area and provides a review of the health and wellbeing needs of the population in the borough. The JSNA shows that the local authority generates greater CO₂ emissions per capita than the national average at 7.3 kt CO₂ compared to 4.3 kt CO₂ nationally. Despite this, there has been a 53.2% reduction in emissions per capita since 2012 in Cheshire West and Chester.

14.5.2.11 Additionally, vehicle miles travelled in Cheshire West and Chester per 100,000 population have increased year-on-year since the pandemic and sits above the national average. However, they remain below pre-pandemic levels (6% lower than in 2019)¹³.

14.5.2.12 Further baseline information relevant to the bio-physical environment is included in the following:

- **Chapter 8: Air Quality;**
- **Chapter 9: Noise and Vibration;**
- **Chapter 11: Landscape and Visual Impact;**
- **Chapter 15: Major Accidents and Disasters; and**
- **Chapter 16: Waste.**

Health and Wellbeing

14.5.2.13 **Table 14.7** below shows data on residents' self-assessment of general health¹⁴. The results show that 0.9% of people in Shakerley have very bad health, which is lower than Cheshire West and Chester and England average. Additionally, when comparing the results to the 2011 Census, the proportion of people suffering with very bad health has decreased from 2.3% to 0.9%.

¹² Cheshire West & Chester (2024) State of the Borough. Online. Accessed at <[State of the Borough dashboard](#) | Cheshire West and Chester Council

¹³ Ibid.

¹⁴ ONS (2021) Census

14.5.2.14 There is a greater proportion of people in Shakerley with self-reported fair or bad health and fewer with good and very good health, which presents a more negative picture of self-reported health.

TABLE 14.7 - SELF-REPORTED GENERAL HEALTH

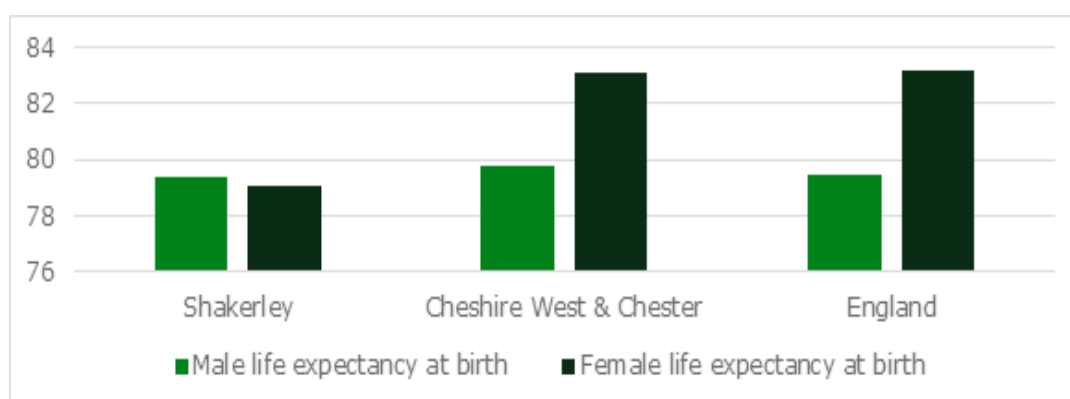
	Shakerley	Cheshire West and Chester	England
Very Good	47.9%	48.8%	48.5%
Good	31.8%	33.3%	33.7%
Fair	14.8%	12.7%	12.7%
Bad	4.6%	4.1%	4.0%
Very Bad	0.9%	1.2%	1.2%

Source: ONS, Census 2021

14.5.2.15 **Figure 14-1** below¹⁵ shows male and female life expectancy at birth in 2016 to 2021. Life expectancy at birth is a useful summary measure of all-cause mortality as it quantifies the differences between areas in units (years of life) that are more readily understood and meaningful than other measures.

14.5.2.16 It represents the cumulative effect of the prevalence of risk factors, the prevalence and severity of disease, and the effectiveness of interventions and treatment. Differences in levels of all-cause mortality reflect health inequalities between different population groups, e.g. by gender or place.

FIGURE 14-1 - LIFE EXPECTANCY AT BIRTH



Source: ONS, Census 2021

¹⁵ Office for Health Improvements (2021) Health Inequalities Dashboard

- 14.5.2.17 **Figure 14-1** shows that life expectancy is lower in Shakerley than local and national averages. There is also a significant variation by gender, where male life expectancy is higher than females, and female life expectancy is significantly lower than local and national averages.
- 14.5.2.18 The percentage of adults classified as obese in Cheshire West and Chester was 23.7% which is below the national average for England of 25.3%¹⁶(2020 / 2021).
- 14.5.2.19 The Sport England Active Lives Survey highlights Cheshire West and Chester as having a higher proportion of adults who are physically active ¹⁷ in comparison to the national average (66.05% and 63.71% respectively). In terms of children's health, 6.67% of children aged 4–5 were categorised as obese or severely obese in Shakerley between 2021 to 2024. This is lower than the rate in Cheshire West and Chester (8.74%) and lower than the rate in England (9.64%)¹⁸.

Economic Environment

- 14.5.2.20 **Chapter 13, Socioeconomic Characteristics** provides baseline information regarding economic activity and employment. The headline message is that there is below average unemployment in Shakerley and Cheshire West and Chester in comparison to England. The proportion of residents with degree level qualifications is above average, and the occupational profile also shows higher than average proportions of residents in highly skilled jobs. Analysis of average salaries indicates higher than average resident income.
- 14.5.2.21 Information from the Department for Work and Pensions (DWP¹⁹) shows that in Cheshire West and Chester there is a below average rate of unemployment benefit claimants²⁰ (2.65% compared to 4.22%). The percentage of unemployed youth (18-24) receiving unemployment benefits is also lower than the national average (4.48% compared to 5.48%, respectively).

Social Environment

Deprivation

- 14.5.2.22 The Index of Multiple Deprivation (IMD) data ranks all Lower Super Output Areas (LSOAs) in England from most deprived to least deprived across seven 'domains' of deprivation: income, employment, education, health, crime, and barriers to housing.

¹⁶ Ibid.

¹⁷ People are described as being active if they have done at least 150 minutes of moderate intensity equivalent physical activity (excluding gardening) in the past week

¹⁸ NHS Digital (2024) National Child Measurement Programme

¹⁹ DWP (2024) Statistics at DWP

²⁰ The proportion of people receiving benefits payable to people who are unemployed receiving either Jobseekers Allowance or Universal Credit for those who are out of work

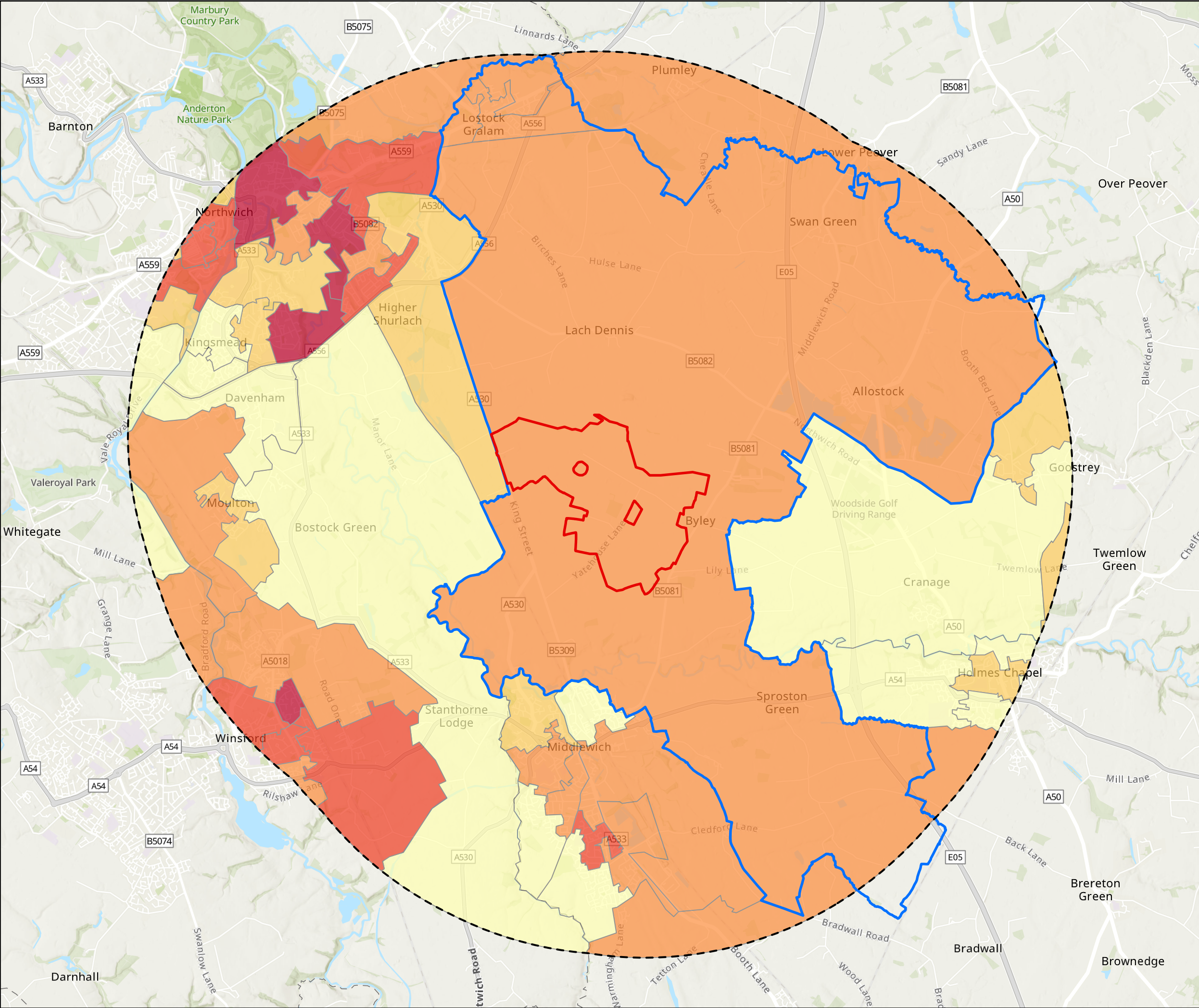
Domain rank 1 is the most deprived and relates to being in the top 10% most deprived in the country.

14.5.2.23 **Figure 14-2** below shows the three LSOA areas in Shakerley ward fall in the mid-range of the overall deprivation domain nationally in the 5th and 6th decile. In terms of health and disability domain the three LSOAs vary from deciles 3, 6 and 7. This suggests there are potentially sensitive communities in some areas of the ward.

14.5.2.24 Further, data shows the average LSOA rank, where a lower rank indicates that an area is experiencing higher levels of deprivation.

14.5.2.25 Shakerley has an average rank of 8,695 on the Living Environment domain. This means that Shakerley has higher levels of local environment deprivation relative to Cheshire West and Chester (17,760) and higher levels of deprivation relative to England (16,158)²¹.

²¹ ONS (2021) Census



Site Boundary

Site Boundary 5km Buffer

Study area - Shakerly Ward

2019 IMD - Decile

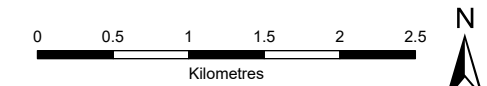
1 - 2

3 - 4

5 - 6

7 - 8

9 - 10



SCALE: See Scale Bar	VERSION: A01
SIZE: A3	DRAWN: MC
PROJECT: 0755727	CHECKED: BH
DATE: 28/08/2025	APPROVED:

Figure 14.2
IMD 2019

Health Inequalities

14.5.2.26 The 2021 Census data presented in **Table 14.8** below shows that Shakerley has a higher rate of residents who are classified as disabled under the Equality Act as well as those whose day to day activities are limited either a little or a lot.

TABLE 14.8 - LONG-TERM HEALTH PROBLEM OR DISABILITY

	Shakerley	Cheshire West and Chester	England
Disabled under the Equality Act	20.2%	18.5%	17.3%
Day-to-day activities limited a lot	8.5%	7.7%	7.3%
Day-to-day activities limited a little	11.7%	10.7%	10.0%
Not disabled under the Equality Act	79.8%	81.5%	82.7%
Has long term physical or mental health condition but day-to-day activities are not limited	7.1%	7.7%	6.8%
No long term physical or mental health conditions	72.7%	73.8%	75.9%

Source: ONS, Census 2021

14.5.2.27 The 2021 Census provides information on the proportion of people providing unpaid care each week. A person is a provider of unpaid care if they give any help or support to family members, friends, neighbours or others because of long-term physical or mental health or disability, or problems related to old age.

14.5.2.28 Overall, the proportion of residents providing unpaid care is slightly higher in both Shakerley and Cheshire West and Chester than in England. The proportion of children providing unpaid care in Shakerley is 1.1%²², which is similar to both Cheshire West and Chester and the national average.

²² ONS (2021) Census – Unpaid care by age, sex and deprivation

TABLE 14.9 - PROVISION OF UNPAID CARE

	Shakerley	Cheshire West and Chester	England
0 Hours	90.4%	90.4%	91.2%
<9 Hours	3.8%	3.5%	3.1%
10-19 Hours	1.5%	1.3%	1.2%
20-34 Hours	0.8%	0.9%	0.9%
35-49 Hours	0.8%	1.0%	1.0%
>50 Hours	2.8%	2.9%	2.6%

Source: ONS, Census 2021

14.5.2.29 **Table 14.10** below shows that both Shakerley and Cheshire West and Chester is less ethnically diverse than the national average with over 95% of residents reporting that they are from White ethnic backgrounds.

TABLE 14.10 – ETHNICITY

	Shakerley	Cheshire West and Chester	England
Asian, Asian British or Asian Welsh	2.4%	2.0%	9.6%
Black, Black British, Black Welsh, Caribbean or African	0.7%	0.6%	4.2%
Mixed or Multiple ethnic groups	1.3%	1.5%	3.0%
White	95.4%	95.3%	81.0%
Other ethnic group	0.1%	0.6%	2.2%

Source: ONS, Census 2021

14.5.3 FUTURE BASELINE CONDITIONS

14.5.3.1 The latest population projections data is the 2022 mid-year population projections by local authority up to 2047²³. The data

²³ ONS (2025) Subnational population projections for England: 2022-based. Online. Available at < [Subnational population projections for England - Office for National Statistics](#)

shows that Cheshire West and Chester is estimated to see a larger proportional increase in its total population than the national average.

- 14.5.3.2 The population of working age, and aged 65 and over is also expected to grow at a higher rate than the national average, while the population of children is expected to fall, the decrease is projected to be smaller in Cheshire West and Chester than across England. The population aged 65 and over is projected to increase by over 40%, above the national average, suggesting that there could be increasing pressures on service provision as a result of the ageing population.

TABLE 14.11 - POPULATION PROJECTIONS (2022-MID YEAR)

	Cheshire West and Chester	England
Total	17.4%	11.2%
0-14	-3.8%	-8.7%
15-64	14.3%	10.4%
65+	42.5%	31.8%

Source: ONS (2025)

14.6 MITIGATION

- 14.6.1.1 Embedded mitigation measures will be incorporated into the design layout and principles of the Proposed Development as part of the design process.
- 14.6.1.2 The assessment will take account of the findings of the following environmental assessments and their recommended mitigation measures:
- **Chapter 8, Air Quality;**
 - **Chapter 9, Noise and Vibration;**
 - **Chapter 11, Landscape and Visual; and**
 - **Chapter 15, Major Accidents and Disasters; and**
 - **Chapter 16, Waste.**
- 14.6.1.3 The Traffic and Transport assessment in the ES for the Consented Development concluded that no mitigation would be required as there are no significant effects associated with construction or operation.
- 14.6.1.4 Where significant adverse effects on population and human health are identified, the assessment will recommend further mitigation measures to reduce or remove effects.

- 14.6.1.5 A Construction Environmental Management Plan (CEMP) will also outline environmental measures. An Updated Outline CEMP will accompany the ES.

14.7 ASSESSMENT OF EFFECTS

14.7.1 CONSTRUCTION

Changes in Health-Related Behaviours

- 14.7.1.1 As described in **Section 14.4.3**, ISEP guidance on scoping health assessments for EIA defines three behaviour-related determinants of health: physical activity; risk-taking behaviours; and diet and nutrition.
- 14.7.1.2 Of these three determinants, potential changes in physical activity are scoped into this assessment. The construction of the Proposed Development could cause disruption to tourism and recreation receptors that promote healthy lifestyles, such as PRow used for walking, horse riding and cycling.
- 14.7.1.3 As noted in the baseline, there are three PRow within the Site. **Chapter 13, Socio-economic Characteristics** reports that impacts on PRow arising from the construction of the Proposed Development, such as closures or temporary diversions, are not expected to be materially different from those assessed in the ES for the Consented Development.
- 14.7.1.4 The ES for the Consented Development reported that there is the potential for Rudheath RB7 to be temporarily affected by the Consented Development, due to the construction of pipeline corridors at one crossing point. Any necessary diversions to PRow will be identified prior to construction and appropriate consent for temporary diversions secured from the Local Planning Authority, CWAC. It is considered that the effects on pedestrian amenity will be **Not Significant**.
- 14.7.1.5 **Chapter 13, Socio-economic Characteristics** also assesses the potential for effects on amenity for users of PRow as a result of a combination of noise or visual impacts.
- 14.7.1.6 Effects on amenity for users of PRow are assessed as **Not Significant** and would be temporary for the duration of construction works. While this would not directly disrupt use of PRow, some residents may choose not to use them while construction works are ongoing, which could have the potential for health effects.
- 14.7.1.7 Any impacts on amenity for users of receptors outside of the Site, including recreational routes such as the Dane Valley Way long distance path and the Cheshire Ring Canal Walk, are expected to be small (see **Chapter 11: Landscape and Visual** for further detail) and **Not Significant**.

- 14.7.1.8 Baseline data shows lower than average proportions of good or very good self-reported health, and higher than average proportions of residents with long-term health problems or disabilities. As a result, the sensitivity of the population in Shakerley is assessed as '**Medium**'. The magnitude of the impact on health at the population level is assessed as '**Small**'. This results in a **Minor Adverse** effect that would be '**Not Significant**'.

Changes in the Social Environment

- 14.7.1.9 The following determinants of health relating to the social environment have been scoped into this assessment:

- open space;
- leisure and play;
- transport modes;
- access and connections; and
- community safety.

Open Space, Leisure and Play

- 14.7.1.10 In relation to open space, leisure and play, there is the potential for impacts on access to receptors, increased demand from an incoming construction workforce, and changes to the visual amenity and enjoyment of open spaces.
- 14.7.1.11 The Traffic and Transport assessment in the ES for the Consented Development concluded that effects on the local highway network arising from construction traffic would be 'Negligible'.
- 14.7.1.12 Traffic and Transport is scoped out of this PEIR as the assessed effect on routes is unchanged from the Consented Development ES, and all traffic and transport effects are expected to remain '**Negligible**' and '**Not Significant**'. Therefore, it is not expected that there will be any impact on access to open space, leisure and play facilities.
- 14.7.1.13 The socio-economic assessment undertaken for the ES for the Consented Development found that the majority of construction workers would commute daily and would therefore not require accommodation within the Study Area. It is not expected that this will change for the Proposed Development. Therefore, it is not expected that there will be any increase in demand for leisure and play facilities from construction workers and their families.
- 14.7.1.14 In relation to amenity and enjoyment of open spaces, the baseline notes that the only leisure or amenity features within the Site are three PRow. **Chapter 13, Socio-economic Characteristics** concludes that there would be no significant effect on the amenity of users of these PRow from a combination of noise and visual effects. Any impacts on amenity for users of receptors outside of the Site,

including recreational routes such as the Dane Valley Way long distance path and the Cheshire Ring Canal Walk, are expected to be small (see **Chapter 11, Landscape and Visual** for further detail).

- 14.7.1.15 While amenity effects would not directly disrupt use of PRow and open space, some residents may choose not to use them while construction works are ongoing or may experience a reduction in their enjoyment of the space, which could have the potential for effects on physical and mental health.
- 14.7.1.16 Based on data that shows lower than average proportions of good or very good self-reported health, and higher than average proportions of residents with long-term health problems or disabilities, the sensitivity of the population of Shakerley is assessed as '**Medium**'. As there would be no impacts on access or on demand for open space, leisure and play, the magnitude of the impact on health at the population level is assessed as '**Small**'. This results in a '**Minor Adverse**' effect that would be '**Not Significant**'.

Transport Modes, Access and Connections

- 14.7.1.17 The Traffic and Transport assessment in the ES for the Consented Development concluded that effects on the local highway network arising from construction traffic would be Negligible. Traffic and Transport is scoped out of this PEIR as the assessed effect on routes is unchanged from the Consented Development ES, and all traffic and transport effects are expected to remain '**Negligible**' and '**Not Significant**'. Therefore, it is not expected that there will be any impact on access to community facilities, or on public transport or other modes of travel.
- 14.7.1.18 As Traffic and Transport is scoped out of the PEIR and no further changes are expected, this health determinant is scoped out of further assessment in the ES.

Community Safety

- 14.7.1.19 Local communities could have concerns around safety associated with construction traffic and activity, including on local roads and around construction sites.
- 14.7.1.20 As noted above, it is not expected that there will be any significant effects on the local highway network, including in terms of road safety. Measures set out in the CEMP, including those listed in Section 14.6, will aim to avoid and minimise impacts on community safety and around construction sites.
- 14.7.1.21 **Chapter 15: Major Accidents and Disasters** assesses potential effects and describes mitigation measures for major accident and disaster management. Sources of potential effects that could arise during construction are identified as:

- the phased construction of caverns, gas processing plant (GPP) and interconnecting pipework;
- increased vehicle movements;
- hydrogen gas breakthrough into debrining pipework during commissioning;
- lifting during construction and commissioning; and
- hot works during construction.

14.7.1.22 The assessment concludes that, with mitigation measures in place, risks arising during construction are 'tolerable if as low as reasonably practicable (ALARP)' and therefore '**Not Significant**'.

14.7.1.23 While the potential for effects in relation to major accidents and disasters is assessed as small, some residents may still experience stress or anxiety because of their perceptions of risk and concerns around potential safety impacts. The magnitude of this impact on population health during construction is assessed as '**Small**', and the sensitivity of the population in the Study Area is assessed as '**Medium**'. This results in a '**Minor Adverse**' effect that would be '**Not Significant**'.

Changes in the Economic Environment

14.7.1.24 The following determinants of health relating to the economic environment have been scoped into this assessment:

- Employment and income; and
- Education and training.

Employment and Income

14.7.1.25 A direct link exists between being in 'good' work and positive health outcomes. Evidence shows that those in decent work have a better quality of life and health outcomes and are protected against social exclusion²⁴. Increased employment opportunities can positively influence health through increasing social contact, involvement in a collective effort or activity, and forming social relationships.

14.7.1.26 As set out in **Chapter 13, Socio-economic Characteristics** construction of the Proposed Development would result in direct and indirect employment opportunities in the local area for a period of 202-2040.

14.7.1.27 The estimated job years created throughout the construction phase equate to 3,346 direct local job years and 3,423 indirect local jobs over the construction period. While these would be temporary jobs,

²⁴ Institute of Health Equity. 2010. *Fair Society, Healthy Lives: The Marmot Review*. London: Institute of Health Equity. Available at: <https://www.instituteofhealthequity.org/resources-reports/fair-society-healthy-lives-the-marmot-review/>

local procurement of labour, goods and services will enhance the benefit to the local economy.

14.7.1.28 **Chapter 13, Socio-economic Characteristics** concludes that the employment effect in the Local Study Area would be '**Negligible**' and, therefore, '**Not Significant**'.

14.7.1.29 The baseline shows that employment is above average in Shakerley and Cheshire West and Chester, and that residents are relatively highly qualified and more likely to be in highly skilled occupations than the average for England. As a result, the sensitivity of the population is assessed as '**Low**'. The magnitude of the impact on health at the population level from new jobs and income is assessed as negligible. This results in effects on health at the population level that would be **Not Significant**.

Education and Training

14.7.1.30 **Chapter 13, Socio-economic Characteristics** discusses the potential wider socio-economic effects arising from the construction of the Proposed Development, including potential training opportunities. Employment opportunities created by the Proposed Development are likely to stimulate labour demand, which could create knock-on investment in skills by other organisations in the supply chain, including apprenticeships. Further information regarding training and skills development will be provided in the ES.

14.7.1.31 The baseline shows that residents of Shakerley and Cheshire West and Chester are more highly qualified than the average for England, and that unemployment – including youth unemployment – is low. The sensitivity of the population is therefore assessed as '**Low**'. As it is not known at this stage whether there would be any training or apprenticeship opportunities created directly by the construction of the Proposed Development, the magnitude of the impact on health at the population level from education and training opportunities is assessed as '**Small**'. This results in a '**Negligible**' effect, and therefore, is '**Not Significant**'.

Changes in the Bio-physical Environment

Air Quality

14.7.1.32 The construction of the Proposed Development has the potential to impact on community health through reduction in air quality.

Chapter 8, Air Quality reports that air quality effects arising from construction dust and from emissions from construction traffic are scoped out of this PEIR as the construction of the Proposed Development is unlikely to lead to new or different effects on air quality compared to the Consented Development, and that embedded mitigation would ensure that any dust impacts noted in

the original ES for the Consented Development would be 'Negligible' or 'Minor'.

- 14.7.1.33 While the potential for effects on air quality from construction dust is assessed as 'Negligible' or 'Minor', some residents may still experience concerns around perceived impacts on air quality. Based on baseline data that shows lower than average proportions of good or very good self-reported health, and higher than average proportions of residents with long-term health problems or disabilities, the sensitivity of the population of Shakerley is assessed as '**Medium**'. The magnitude of the impact is assessed as '**Small**'. This results in a '**Minor Adverse**' effect, and is therefore, '**Not Significant**'.

Noise and Vibration

- 14.7.1.34 The construction of the Proposed Development has the potential to impact on community health through increases in noise and vibration. **Chapter 9: Noise and Vibration** assesses noise effects for noise sensitive receptors within the relevant study area and reports that, after mitigation, there would be no significant adverse noise effects for noise sensitive receptors arising from construction activity. There could, however, be community concerns around perceived impacts on noise.
- 14.7.1.35 Baseline data shows lower than average proportions of good or very good self-reported health, and higher than average proportions of residents with long-term health problems or disabilities, the sensitivity of the population of Shakerley is assessed as '**Medium**'. The magnitude of the impact is assessed as '**Small**'. This results in a '**Minor Adverse**' effect, and is therefore **Not Significant**.

Waste

- 14.7.1.36 **Chapter 16, Waste** describes the mitigation measures that would be put in place in relation to waste generation and handling. These including implementation of a construction Site Waste Management Plan (SWMP) that will form part of the CEMP and will include a range of waste minimisation actions. Assuming full implementation of these measures, **Chapter 16, Waste** concludes that the effect on landfill capacity would be '**Negligible**'.
- 14.7.1.37 Therefore, it is not expected that there will be any significant effect on human health at the population level from waste generated during construction.

14.7.2 OPERATION AND MAINTENANCE

Changes in Health-Related Behaviours

- 14.7.2.1 **Chapter 13, Socio-economic Characteristics** reports that impacts on PRoW arising from the operation and maintenance of the

Proposed Development are not expected to be materially different from those assessed in the ES for the Consented Development.

- 14.7.2.2 As noted in the baseline, there are three PRow within the Site. The ES for the Consented Development does not report any impacts on PRow during the operation and maintenance phase.
- 14.7.2.3 **Chapter 13, Socio-economic Characteristics** assesses the potential for effects on amenity for users of PRow as a result of a combination of noise or visual impacts.
- 14.7.2.4 Effects on amenity for users of PRow within the Site Boundary are assessed as **Not Significant**. Any impacts on amenity for users of receptors outside of the Site, including recreational routes such as the Dane Valley Way long distance path and the Cheshire Ring Canal Walk, are expected to be small (see **Chapter 11, Landscape and Visual** for further detail).
- 14.7.2.5 While amenity effects would not directly disrupt use of PRow and recreational routes, some residents may choose not to use them, which could have the potential for long-term health effects.
- 14.7.2.6 The sensitivity of the population is assessed as '**Medium**'. The magnitude of the impact on health at the population level is assessed as '**Small**'. This results in a '**Minor Adverse**' effect, and therefore, '**Not significant**'.

Changes in the Social Environment

- 14.7.2.7 The following determinants of health relating to the social environment have been scoped into this assessment:
- open space;
 - leisure and play;
 - transport modes;
 - access and connections; and
 - community safety.

Open Space, Leisure and Play

- 14.7.2.8 In relation to open space, leisure and play, there is the potential for impacts on access to receptors and changes to the visual amenity and enjoyment of open spaces.
- 14.7.2.9 The Traffic and Transport assessment in the ES for the Consented Development reported that operational traffic associated with the Consented Development would be relatively small in number, with an operational workforce of 35 staff (over two or three shifts).
- 14.7.2.10 On this basis the effect of operational traffic was assessed as '**Negligible**'. Traffic and Transport is scoped out of this PEIR as the assessed effect on routes is unchanged from the Consented

Development ES, and all traffic and transport effects will remain '**Negligible**' and '**Not Significant**'. Therefore, it is not expected that there will be any impact on access to open space, leisure and play facilities.

- 14.7.2.11 In relation to amenity and enjoyment of open spaces, the baseline notes that the only leisure or amenity features within the Site are three PRow. **Chapter 13, Socio-economic Characteristics** concludes that the effect on amenity for users of these PRow would be **Not Significant** from a combination of noise and visual effects. Any impacts on amenity for users of receptors outside of the Site, including recreational routes such as the Dane Valley Way long distance path and the Cheshire Ring Canal Walk, are expected to be small (see **Chapter 11: Landscape and Visual** for further detail).
- 14.7.2.12 While amenity effects would not directly disrupt use of PRow, recreational routes and open space, some residents may choose not to use certain resources or may experience a reduction in their enjoyment of them, which could have the potential for long-term effects on physical and mental health. The sensitivity of the population is assessed as medium. As there would be no impacts on access to open space, leisure and play, the magnitude of the impact on health at the population level is assessed as '**Small**'. This results in a '**Minor Adverse**' effect, and therefore, '**Not Significant**'.

Transport Modes, Access and Connections

- 14.7.2.13 As noted, the Traffic and Transport assessment in the ES for the Consented Development reported that operational traffic associated with the Consented Development would be relatively small in number, with an operational workforce of 35 staff (over two or three shifts). On this basis the effect of operational traffic was assessed as '**Negligible**'. Traffic and Transport is scoped out of this PEIR as the assessed effect on routes is unchanged from the Consented Development ES, and all traffic and transport effects will remain '**Negligible**' and '**Not Significant**'.

Community Safety

- 14.7.2.14 Local communities could have concerns around safety associated with the operation of the Proposed Development, which could have potential impacts on health and wellbeing.
- 14.7.2.15 **Chapter 15, Major Accidents and Disasters** assesses potential effects and describes mitigation measures for major accident and disaster management. The primary risks identified during operation and maintenance relate to the storage, transfer, and processing of hydrogen under high pressure. The most significant hazard is the potential for loss of containment, which could result in ignition and escalation to jet fire or explosion.

- 14.7.2.16 Mitigation measures, including measures embedded in the design and the implementation of a Safety Management System, are designed to ensure that operational risks remain within acceptable limits and are reduced to a level that is ALARP. The assessment concludes that, with mitigation measures in place, risks arising during construction are 'tolerable if ALARP' and are therefore '**Not Significant**'.
- 14.7.2.17 While the potential for effects in relation to major accidents and disasters is assessed as '**Small**', some residents may still experience stress or anxiety because of their perceptions of risk and concerns around potential safety impacts. Local residents are accustomed to the existing gas storage facilities in the area, however the use of the Proposed Development to store hydrogen specifically may contribute to community concerns.
- 14.7.2.18 The sensitivity of the population in Shakerley is assessed as '**Medium**' and the magnitude of the impact on health at the population level is assessed as '**Low**', although it is acknowledged that for some people within the population the impact in terms of stress and anxiety could be greater. At the population level, the effect is assessed as a '**Minor Adverse**' effect and '**Not Significant**'.

Changes in the Economic Environment

- 14.7.2.19 The following determinants of health relating to the economic environment have been scoped into this assessment:
- employment and income; and
 - education and training.

Employment and Income

- 14.7.2.20 A direct link exists between being in 'good' work and positive health outcomes. Evidence shows that those in decent work have a better quality of life and health outcomes and are protected against social exclusion. Increased employment opportunities can positively influence health through increasing social contact, involvement in a collective effort or activity, and forming social relationships.
- 14.7.2.21 As set out in **Chapter 13, Socio-economic Characteristics** the operation and maintenance phase of the Proposed Development would result in direct and indirect employment opportunities in the local area for a period of 50 years from 203. The estimated jobs created during the first year of operation and maintenance (203) equates to 30 direct local jobs. Additionally, there would be indirect effects with 35 indirect local jobs in 203. While operational jobs would be relatively small, they would be long-term for the lifetime of the Proposed Development, and would support further supply chain opportunities within the local economy.

14.7.2.22 **Chapter 13, Socio-economic Characteristics** concludes that the employment effect in the Local study area would be **Negligible** effect (**Not Significant**). As the baseline shows that employment is above average in Shakerley ward and in Cheshire West and Chester, and that residents are relatively highly qualified and more likely to be in highly skilled occupations than the average for England, the sensitivity of the population is assessed as '**Low**'. The magnitude of the impact on health at the population level from additional employment and income is assessed as '**Negligible**'. This results in no significant effect on health at the population level.

Education and Training

14.7.2.23 **Chapter 13, Socio-economic Characteristics** discusses the potential wider socio-economic effects arising from the operation and maintenance phase of the Proposed Development, including supporting the continued development of a skilled local hydrogen workforce. The majority of the jobs created are likely to be in occupations related to STEM subjects²⁵ and often highly skilled jobs requiring Level 4/5 qualifications²⁶, and so it is likely that there will be opportunities, particularly for young people, to develop their skills. Further information regarding training and skills development will be provided in the ES.

14.7.2.24 The baseline shows that residents of Shakerley and Cheshire West and Chester are relatively highly qualified compared to the average for England and that unemployment – including youth unemployment – is low. The sensitivity of the population is therefore assessed as '**Low**'. As it is not known at this stage whether there would be any training or apprenticeship opportunities created directly by the operation of the Proposed Development, the magnitude of the impact on health at the population level from education and training opportunities is assessed as small. This results in a '**Negligible**' effect and '**Not Significant**'.

Changes in the Bio-physical Environment

Climate Change Mitigation and Adaptation

14.7.2.25 Once in operation, the Proposed Development may have an impact on population health and wellbeing through enhanced climate change mitigation and adaptation. An assessment of these effects will be provided in the ES, drawing on the findings of the final Climate Change and GHG assessment.

²⁵ ClimateXChange. 2023. *Skills Demand in the Hydrogen Sector*. Edinburgh: ClimateXChange. Accessed July 2025.

²⁶ Climate Capture and Storage Association (CCSA). 2023. *CCSA Workforce & Skills Position Paper*. London: CCSA.

Air Quality

- 14.7.2.26 The operation and maintenance phase of the Proposed Development has the potential to impact on community health through reduction in air quality. There could also be community concerns around perceived impacts on air quality. **Chapter 8: Air Quality** reports that, during operation and maintenance, there will be no routine emissions to air from the Hydrogen Storage Facility, only maintenance and emergency flaring. The assessment concludes that operation and maintenance effects due to flaring on sensitive human receptors are anticipated to be negligible to minor, and therefore not significant.
- 14.7.2.27 While the potential for effects on air quality from maintenance and emergency flaring is assessed as negligible or minor, some residents may still experience concerns around perceived impacts on air quality. Based on baseline data that shows lower than average proportions of good or very good self-reported health, and higher than average proportions of residents with long-term health problems or disabilities, the sensitivity of the population of Shakerley is assessed as '**Medium**'. The magnitude of the impact is assessed as '**Small**'. This results in a '**Minor Adverse**' effect (**not significant**).

Noise and Vibration

- 14.7.2.28 The operation and maintenance phase of the Proposed Development has the potential to impact on community health through increases in noise and vibration. There could also be community concerns around perceived impacts on noise. **Chapter 9: Noise and Vibration** provides a preliminary qualitative assessment of noise effects for noise sensitive receptors within the relevant study area, and sets out mitigation that the applicant intends to implement with the aim of ensuring that operational noise impacts are no worse than Minor, which would be Not Significant.
- 14.7.2.29 Based on baseline data that shows lower than average proportions of good or very good self-reported health, and higher than average proportions of residents with long-term health problems or disabilities, the sensitivity of the population of Shakerley is assessed as '**Medium**'. Assuming that, after mitigation, there would be no significant adverse noise effects, the magnitude of the impact is assessed as '**Small**'. This results in a '**Minor Adverse**' effect that is assessed as '**Not Significant**'.

Waste

- 14.7.2.30 **Chapter 6, Waste** describes the mitigation measures that would be put in place in relation to waste generation and handling. These including a framework for waste management during the operational phase, including handling of special wastes, which will be included

within the Proposed Development's Environmental Management System (EMS). Assuming full implementation of these measures, **Chapter 6, Waste** concludes that the effect on landfill capacity would be '**Negligible**'. Therefore, it is not expected that there will be any significant effect on human health at the population level from waste generated during operation.

Electromagnetic Fields (EMF)

- 14.7.2.31 Once in operation, the Proposed Development may have an impact on population health and wellbeing through electromagnetic fields (EMF). An assessment of EMF sources will be included in the ES once more design information is available. However, it is anticipated there will be no EMF sources associated with the Proposed Development.

14.8 DECOMMISSIONING

- 14.8.1.1 It is assumed that effects arising during decommissioning will be comparable, or less severe, than those associated with construction. Decommissioning effects are therefore considered as part of the construction assessment.

14.9 SUMMARY AND CONCLUSIONS

14.9.1 SUMMARY OF INDIRECT EFFECTS

- 14.9.1.1 No indirect effects are anticipated at this stage.

14.9.2 SUMMARY OF CUMULATIVE EFFECTS

- 14.9.2.1 The cumulative effects on impacts from the Proposed Development together with impacts from other planned projects or developments on the same receptors are addressed in **Chapter 18, Cumulative Effects Assessment**. The ES will summarise the conclusions of the Cumulative Effects Assessment (CEA) that are relevant to community health.

14.9.3 CONCLUSION

- 14.9.3.1 This chapter has provided an assessment of the effects of community health as a result of the Proposed Development in relation to the wider determinants of health. The assessment of effects was based on the assumption of a medium sensitivity within the community health baseline. The assessments of related chapters were used to inform the magnitude of impact and the overall determining of the significance of effects.

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