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18.0 SOCIO-ECONOMICS AND LAND USE

18.1 Introduction

18.1.1 This chapter of the Preliminary Environmental Information (PEI) Report provides an initial assessment of the potential socio-economic impacts arising from the construction, operation (including maintenance) and decommissioning of the Proposed Development. It reports on the potential effects on employment, local businesses, land use and population.

18.2 Legislation and Planning Policy Context

Policy Context

National Energy Policy

National Policy Statements for Energy (EN-1) (2011)

18.2.1 The National Policy Statements (NPSs) for energy infrastructure set out the Government's policy for delivery of major energy infrastructure (UK Government, 2011). The Overarching NPS for Energy (EN-1) identifies that "*information on the likely significant social and economic effects of the development*" should be set out alongside '*how any likely significant negative effects would be avoided or mitigated*'. Impacts should be assessed at local or regional level and cumulative effects should also be considered. This chapter considers the effects identified in this policy for the Proposed Development.

Draft Overarching National Policy Statement for Energy (EN-1) (2023)

18.2.2 The Draft Overarching NPS for Energy (EN-1) was published in March 2023 by the Department for Energy Security and Net Zero (DESNZ) (DESNZ, 2023), and updates the existing NPS EN-1 (DECC, 2011). In addition to the socio-economic impacts of energy infrastructure development outlined in the existing NPS EN-1, the Draft NPS at 5.13.4 outlines additional socio-economic impacts to be considered:

- *"the creation of jobs and training opportunities. Applicants may wish to provide information on the sustainability of the jobs created, including where they will help to develop the skills needed for the UK's transition to Net Zero*
- *the contribution to the development of low-carbon industries at the local and regional level as well as nationally*
- *the provision of additional local services and improvements to local infrastructure, including the provision of educational and visitor facilities*
- *any indirect beneficial impacts for the region hosting the infrastructure, in particular in relation to use of local support services and supply chains*
- *effects on tourism*
- *the impact of a changing influx of workers during the different construction, operation and decommissioning phases of the energy infrastructure. This could change the local population dynamics and could alter the demand for services*

and facilities in the settlements nearest to the construction work (including community facilities and physical infrastructure such as energy, water, transport and waste). There could also be effects on social cohesion depending on how populations and service provision change as a result of the development

- *cumulative effects - if development consent were to be granted to for a number of projects within a region and these were developed in a similar timeframe, there could be some short-term negative effects, for example a potential shortage of construction workers to meet the needs of other industries and major projects within the region"*

18.2.3 In alignment with the Draft NPS EN-1, this chapter considers the socio-economic and land use effects detailed in this policy for the Proposed Development.

Energy White Paper: Powering Our Net Zero Future (2020)

18.2.4 The Energy White Paper was published by the UK Government in December 2020 (UK Government, 2020). Within this, the Prime Minister's Ten Point Plan is outlined with respect to the areas of focus for green energy in the UK. Among these key points, the Hydrogen and the Carbon Capture, Usage and Storage (CCUS) sectors are considered important emerging green sectors for the UK. For Hydrogen, the paper states that "the UK is aiming for 5GW of low-carbon hydrogen production capacity by 2030". For CCUS, the paper states that "our ambition is to capture 10Mt of carbon dioxide a year by 2033". Given the intended future use of the Proposed Development, this chapter takes into account these national goals, which the Proposed Development supports.

National Planning Policy

National Planning Policy Framework (NPPF, 2023)

18.2.5 The National Planning Policy Framework (NPPF) (Department for Levelling Up, Housing and Communities (DLUHC), 2023) and the wider planning system are currently undergoing consultation and the NPPF was subject to consultation most recently in March 2023. The NPPF sets out the Government's planning policies in a single document. The NPPF acknowledges that while it "does not contain specific policies for nationally significant infrastructure projects" (NSIPs), it may be given weight in decision-making for NSIPs where the policies in the NPPF are "other matters that are relevant".

18.2.6 From December 2022 to March 2023 the Department for Levelling Up, Housing and Communities (DLUHC) held a consultation with the Local Government Association (LGA) in respect of the Levelling-up and Regeneration Bill: reforms to nation planning policy, sought views on updates to the NPPF (the 'Draft NPPF') (LGA, 2023). The LGA has since noted that the proposed amendments to the NPPF "do not go far enough to underline the challenges posed by climate change". The LGA also stated that plans should be led by the most up to date evidence and they "urge the Government to consider the impact on local plan preparation timelines of the release of the ONS population projections in mid-2024".

18.2.7 The NPPF places emphasis on its overarching economic, social and environmental objectives and presumption in favour of sustainable development. It states that

planning policies should help create the conditions in which businesses can invest, expand and adapt. The following sections of the NPPF are relevant to this topic.

- 18.2.8 Section 8 *"Promoting healthy and safe communities"* makes specific reference to the enablement of *"healthy lifestyles, especially where this would address identified local health and well-being needs – for example through the provision of safe and accessible green infrastructure, sports facilities, local shops"*. This section also goes on to emphasise the provision of *"social, recreational and cultural facilities the community needs"*.
- 18.2.9 Paragraph 98 describes that *"access to a network of high quality open spaces and opportunities for sport and physical activity is important for the health and well-being of communities"*. Moreover, paragraph 100 states that *"decisions should protect and enhance public rights of way"*.
- 18.2.10 In line with the NPPF, this chapter assesses the effect of the Proposed Development on local communities, community facilities, open space and Public Rights of Way (PRoWs).

Planning Policy Guidance (PPG): Housing and economic land availability assessment

- 18.2.11 The PGG for Housing and economic land availability assessments was published in 2014 and last updated in July 2019 (UK Government, 2019). This PPG sets out the required assessment methodology to:
- *"identify sites and broad locations with potential for development;*
 - *assess their development potential; and*
 - *assess their suitability for development and the likelihood of development coming forward (the availability and achievability)."*

- 18.2.12 The PPG also states that *"Development potential is a significant factor that affects the economic viability of a site / broad location and its suitability for a particular use. Therefore, assessing achievability (including viability) and suitability can usefully be carried out in parallel with estimating the development potential"*.

- 18.2.13 In line with PPG, this chapter assesses any impacts of the Proposed Development on the development potential of sites.

Planning Policy Guidance (PPG): Open Space, Sports and Recreation Facilities, Public Rights of Way and Local Green Space

- 18.2.14 This PPG was published in March 2014, and establishes key advice on the designation on open space and PRoWs (UK Government, 2014). Within this, the guidance states that *"Open space should be taken into account in planning for new development and considering proposals that may affect existing open space"*. It also states that *"Public rights of way form an important component of sustainable transport links and should be protected or enhanced. The Defra Rights of Way circular gives advice to local authorities on recording, managing and maintaining, protecting and changing public rights of way"*.



18.2.15 In line with PPG guidance, this chapter assesses the impacts of the Proposed Development on existing open space.

Regional Planning Policy

Tees Valley Combined Authority Strategic Economic Plan (2016-2026)

18.2.16 The Tees Valley Strategic Economic Plan (SEP) (2016-2026) sets out the priorities for economic growth in the Tees Valley area (Tees Valley Combined Authority (TVCA), 2016). By 2026, the Combined Authority aim to create 26,000 additional jobs and grow the Tees Valley economy by £2.8 billion. The process, chemicals and energy sector is one of seven priority sectors identified as having the potential for further growth in the Tees Valley. The SEP is focused around six themes which reflect the main priorities over the ten-year plan period. This includes “*research, development, innovation and energy*” where the aim is to “*introduce new processes and practices which reduce carbon emissions, increase productivity and the availability of high value jobs*”. This includes carbon capture and storage (CCS).

18.2.17 The SEP also includes the Strategic Priority of “*Place*”, which aims to “*revitalise our town centres and urban core, bring forward surplus public and blighted brownfield land for development and strengthen our commercial property offer*”. It also seeks to create a place where business wants to invest, which is supported by the Proposed Development. The Proposed Development would also help to promote the location as a core energy cluster, develop brownfield land in the South Tees Development Corporation (STDC) area and promote the use of low carbon energy options.

Local Planning Policy

18.2.18 This section considers the relevant local policies of Redcar and Cleveland Borough Council (RCBC), Stockton on Tees Borough Council (STBC) and Hartlepool Borough Council (HBC).

Redcar and Cleveland Local Plan (2018)

18.2.19 The Redcar and Cleveland Local Plan and Policies Map (RCBC, 2018) was adopted in May 2018. A key issue identified in the Local Plan is the fragility of the economic landscape and a need for jobs to be generated in the private sector. The Local Plan indicates future growth is likely to be driven by low carbon technologies and manufacturing, energy and food security and an efficient use of natural resources.

18.2.20 The Local Plan indicates that creating local employment opportunities is key to delivering economic growth. The decline of the traditional steel and chemical industries has impacted on many communities in Redcar and Cleveland leading to areas of deprivation and a declining population.

18.2.21 Policy ED 8 focuses on the Rural Economy, stating that, among other actions, the rural economy will be supported by:

- “*promoting and retaining rural community facilities and local services which meet rural needs; and*
- *supporting the management of land for nature conservation and heritage assets.*”



18.2.22 The plan also states that *"Rural economic development will not be supported which would result in the loss of the best and most versatile agricultural land"*.

18.2.23 The Local Plan allocates land for specialist employment uses, and places focus on the role of the STDC. The Local Plan states that *"this substantial area of economic opportunity"* will *"drive economic growth and regeneration"* in the area. Therefore, the Proposed Development supports the economic ambitions of RCBC, and this chapter will assess to what extent community facilities, agricultural land and development land will be affected by the Proposed Development.

Stockton on Tees Local Plan (2019)

18.2.24 Stockton-on-Tees Borough Council Local Plan (STBC, 2019) was adopted in January 2019. A Strategic Priority set out in the Local Plan is to *"encourage economic growth, job creation and a more entrepreneurial culture within the Borough, as a means of diversifying the economic base and strengthening existing economic strengths, clusters and sectors"*.

18.2.25 The Local Plan also allocates sufficient employment sites to ensure economic growth will be prioritised, including the use of previously developed or under-used land. The Proposed Development supports the targets for STBC regarding economic growth in the borough.

Hartlepool Local Plan (2018)

18.2.26 HBC adopted the Hartlepool Local Plan in May 2018 (HBC, 2018). A theme of *'Hartlepool's Ambition'* for the Local Plan is for *'Jobs and the Economy, Lifelong Learning and Skills'*. The Local Plan focuses on this theme through the following spatial objectives:

- to diversify the economic base of Hartlepool and promote an entrepreneurial culture to create more employment opportunities for local people;
- to develop Hartlepool as a destination of choice for inward investment;
- to enhance the tourism offer; to support the development of educational and training facilities that will develop a skilled workforce;
- to facilitate development in the key investment areas in the Borough; and
- to continue to protect and enhance the vitality and viability of the Town Centre.

18.2.27 In line with HBC ambitions, the Proposed Development supports objectives for economic growth, and in creating employment opportunities for local people.

Tees Valley Joint Minerals and Waste Core Strategy Development Plan Document (DPD) and Waste Policies and Sites DPD (both 2011)

18.2.28 The Tees Valley Minerals and Waste Development Plan Documents (DPDs) – prepared jointly by the boroughs of Darlington, Hartlepool, Middlesbrough, Redcar and Cleveland and Stockton-on-Tees – bring together the planning issues for minerals and waste within the Tees Valley area (TVCA, 2011).

18.2.29 Within Redcar and Cleveland, there are a number of policies relating to minerals, waste and recycling processing, allocated in the Tees Valley Joint Minerals and Waste Development Plan Document (DPD). These are as follows:

- MWC9 Sewage Treatment: development involving the extension or upgrade of existing sewage treatment facilities, including at the Bran Sands Regional Sludge Treatment Centre (Redcar and Cleveland) will be supported. This is located within the boundary of the Proposed Development Site, adjacent to the Tees.
- MWC5 Protection of Minerals Extraction sites: operational safeguarding areas are identified around the following minerals extraction sites: a) Hart Quarry (Hartlepool) and b) Stockton Quarry (Stockton-on-Tees). The latter is located along the River Tees within the boundary of the Proposed Development Site. Within these areas, development proposals will be required to demonstrate that they are compatible with the permitted minerals operations.

18.2.30 Within the Waste Policies and Sites DPD, two Mineral and Waste Policies (MWP) are noted to be located within the vicinity of the Proposed Development Site to the south. These policies, MWP8 and MWP10(b), both refer to the South Tees Eco-Park, and provide proposals for facilities to recycle up to a combined total of 700,000 tonnes per year of construction and demolition wastes by 2016, rising to 791,000 tonnes per year in 2021. The site of the South Tees Eco-Park is located towards the south of the boundary of the Proposed Development Site.

Further Guidance

18.2.31 Whilst there is no dedicated United Kingdom (UK) legislation that details the content required for a socio-economic assessment as part of an EIA, the preliminary socio-economic assessment presented in this chapter is based upon a range of relevant guidance. This includes:

- Additionality Guide (4th Edition) (Homes and Communities Agency (HCA), 2014);
- Research to Improve the Assessment of Additionality (Department for Business, Innovation and Skills (BIS), 2009);
- The Green Book – Appraisal and Evaluation in Central Government (HM Treasury, 2022); and
- The Magenta Book – Guidance for Evaluation (HM Treasury, 2020).

18.3 Assessment Methodology and Significance Criteria

18.3.1 The preliminary assessment is based on information obtained to date. It should be read in conjunction with the following chapters:

- Chapter 4: Proposed Development (PEI Report, Volume I);
 - Chapter 8: Air Quality (PEI Report, Volume I);
 - Chapter 9: Surface Water, Flood Risk and Water Resources (PEI Report, Volume I);
 - Chapter 11: Noise and Vibration (PEI Report, Volume I);
-



- Chapter 15: Traffic and Transport (PEI Report, Volume I);
- Chapter 16: Landscape and Visual Amenity (PEI Report, Volume I);
- Chapter 19: Climate Change (PEI Report, Volume I); and
- Chapter 22: Human Health (PEI Report, Volume I).

Study Area

- 18.3.2 Office for National Statistics statistical geographies have been used to define the Study Area for the socio-economic assessment as described below.
- 18.3.3 The Lower layer Super Output Area (LSOAs)¹ included within the H2Teesside Study Area follow a best-fit approach, to represent the local areas potentially impacted by the Proposed Development. The inclusion of additional LSOAs were considered as a part of defining the H2Teesside Study Area, including those in the local authority of Hartlepool. However, only a small proportion of the Hartlepool LSOAs lie within the boundary of the Proposed Development Site. Therefore, these areas have not been included in the H2Teesside Study Area.
- 18.3.4 The direct impact areas are listed below for which the statistical information has been compared for this baseline:
- the H2Teesside Study Area²;
 - Middlesbrough and Stockton Travel To Work Area (TTWA); and
 - England.

Impact Assessment Methodology

- 18.3.5 A preliminary assessment of potential impacts has been undertaken to determine the potential effects of the Proposed Development on baseline socio-economic conditions. This follows the methodology stated in Chapter 2: Assessment Methodology (PEI Report, Volume I) and assesses the level of significance of effects. The following potential effects have been assessed:
- direct and indirect employment creation;
 - the potential for the promotion/provision of training and apprenticeship opportunities, upskilling locally unemployed and potential wider economic benefits;
 - local traffic flows on the local and strategic road networks;
 - PRoWs;

¹ LSOAs are a geographic hierarchy with an average population of between 1,000 and 2,000 people. LSOAs are used to collect data at a local level to ascertain the key trends of an area in comparison to regional and national trends.

² Includes the following Lower layer Super Output Areas (LSOAs) : E01012107, E01032560, E01032561, E01012114, E01012109, E01012198, and E01012279. LSOAs from the Hartlepool local authority do not accurately cover the Proposed Development Site and would misrepresent the baseline statistics covered in this section. Therefore, they have not been included within the geography for the H2Teesside Study Area.



- local businesses, residential properties, educational and community facilities, either direct (demolition/land take) or indirect via in combination effects identified by other discipline assessments; and
- any socio-economic impacts from land use impacts (such as effect on planned developments).

Significance Criteria

18.3.6 For socio-economics, there is no accepted definition of what constitutes a significant (or not significant) socio-economic effect. It is recognised that ‘significance’ reflects the relationship between the scale of impact (magnitude) and the sensitivity (or value) of the affected resource or receptor. As such the significance criteria for socio-economic effects has been assessed using the expert judgment of authors with professional experience in socio-economics, and relies on the following considerations:

- The sensitivity of a given receptor: the assessment takes account of the qualitative (rather than quantitative) ‘*sensitivity*’ of each receptor, particularly their ability to respond to change based on the given impacts of the Proposed Development.
- The magnitude of the impact: this entails consideration of the size of the impact on people, businesses, users of PROWs, private properties, employees and development land in the context of the area in which impacts will be experienced.

18.3.7 These factors have then been combined to determine the consequent significance of the effect.

Receptor Sensitivity

18.3.8 The sensitivity of socio-economic receptors is assessed as high, medium, low or very low. Socio-economic receptors for this assessment include:

- agricultural, industrial and development land;
- users of PROWs;
- private assets (including resident and business premises);
- users of education and community facilities; and
- construction and decommissioning employees using temporary accommodation.

18.3.9 The criteria for assessing and classifying levels of receptor sensitivity used within the assessment are defined in Table 18-1, based on professional judgement.

Table 18-1: Sensitivity Classification

LEVEL OF SENSITIVITY	DESCRIPTION
High	There are limited/no comparable and accessible alternatives to the receptor that exist within the relevant



LEVEL OF SENSITIVITY	DESCRIPTION
	catchment area; and/or receptors have limited ability to absorb the change.
Medium	There are limited comparable and accessible alternatives to the receptor within the relevant catchment area; and/or receptors have limited ability to absorb the change.
Low	Receptors are able to relatively easily absorb the change; and/or there are some comparable and accessible alternatives to the receptor that exist within the relevant catchment area.
Very low	Receptors are able to relatively easily absorb the change; and/or there are many comparable and accessible alternatives to the receptor that exist within the relevant catchment area.

Impact Magnitude

18.3.10 The magnitude of the socio-economic impacts associated with the Proposed Development have been assessed as being high, medium, low or very low – refer to Table 18-2. The receptors detailed in the receptor sensitivity criteria are also considered for the magnitude criteria. This has been determined by having regard to:

- Extent of change – the absolute number of people affected and the size of area in which the impact will be experienced (i.e., the level of change to baseline conditions including the proportion of the existing workforce);
- Scale of the impact – the relative magnitude of each impact in its relevant market context (for example, the impacts on local employment will be considered in the context of the overall size of the local labour market); and
- Duration of impact – more weight is given to long-term, permanent changes than to short-term, temporary ones. Temporary to short-term impacts are those associated with the construction works. Medium to long-term impacts are those associated with the operation of the Proposed Development.

Table 18-2: Magnitude Classification

MAGNITUDE	DESCRIPTION
High	An impact that is expected to have considerable adverse or beneficial socio-economics effects. Such impacts will typically affect large numbers of businesses, workers or residents.
Medium	An impact that will typically have a noticeable effect on a moderate number of businesses, workers or residents, and will lead to a small change to the study area's baseline socio-economic conditions.

MAGNITUDE	DESCRIPTION
Low	An impact that is expected to affect a small number of businesses, workers or residents or an impact that may affect a larger number of receptors but does not materially alter the study area's baseline socio-economic conditions.
Very low	An impact which has very little change from baseline conditions where the change is barely distinguishable, approximating to a "no change" situation.

Overall Significance of Effects

18.3.11 The overall effects of the Proposed Development have been defined in line with Chapter 2: Assessment Methodology (PEI Report, Volume I):

- Beneficial – advantageous or positive effect to an environmental resource or receptor;
- Negligible – imperceptible effect to an environmental resource or receptor;
- Adverse – detrimental or negative effects to an environmental resource or receptor; and
- No effect – no discernible effects on a receptor.

18.3.12 Duration of effect is also considered, with more weight given to permanent changes than to temporary ones. Permanent effects are generally those associated with the completed Proposed Development. Temporary effects are those associated with the construction works. For the purposes of this assessment, short-term effects are of one year or less, medium-term effects of one to five years and long-term effects for durations over five years.

18.3.13 Where an effect is assessed as being beneficial or adverse, the effect has been classified as Major, Moderate, Minor or Negligible. The assessment of significance is informed by considering the sensitivity of the receptor (refer to Table 18-1) and the magnitude of impact (refer to Table 18-2) as set out in Table 18-3. For the purposes of this assessment, only Moderate and Major effects are considered significant.

Table 18-3: Significance of Effects Matrix

MAGNITUDE OF IMPACT	SENSITIVITY OF RECEPTOR				
	NEGLIGIBLE	LOW	MEDIUM	HIGH	VERY HIGH
HIGH	Minor	Moderate	Moderate	Major	Major
MEDIUM	Negligible	Minor	Moderate	Moderate	Major
LOW	Negligible	Negligible	Minor	Moderate	Moderate



MAGNITUDE OF IMPACT	SENSITIVITY OF RECEPTOR				
	NEGLIGIBLE	LOW	MEDIUM	HIGH	VERY HIGH
NEGLIGIBLE	Negligible	Negligible	Negligible	Minor	Minor

Sources of Information/Data

18.3.14 The socio-economic baseline has been determined and informed using a number of recognised data sources, including the following Office for National Statistics (ONS) datasets: Census 2021 (ONS, 2021a); Indices of Multiple Deprivation (MHCLG, 2019b); Business Register and Employment Survey (ONS, 2021b); and Population Projections (ONS, 2018).

Consultation

18.3.15 An EIA Scoping Opinion was requested from the Inspectorate in April 2023. A response was received on 17th May 2023. A high-level summary of responses to the Scoping Opinion relevant to socio-economic and land use are outlined in Table 18-4.



Table 18-4: Responses to Scoping Opinion Comments

CONSULTEE	DATE AND METHOD OF CONSULTATION	SUMMARY OF CONSULTEE COMMENTS	SUMMARY OF RESPONSE/ HOW COMMENTS HAVE BEEN ADDRESSED
The Inspectorate	Scoping Opinion 17 th May 2023	<p>The Scoping Report describes that parts of the proposed hydrogen pipeline corridor comprise BMV land under the Agricultural Land Classification (ALC) system. ALC Grade 2 land is located near Kirkleatham. Grade 3 land near Greatham is identified as being possible BMV land.</p> <p>The Applicant seeks to scope out effects on BMV land on the basis that impacts would be temporary during pipeline installation. It is stated that in the worst-case scenario of open cut method, soil that is disturbed would be retained in-situ to infill the trench.</p> <p>The Scoping Report does not state the area of BMV land that would be affected or whether there would be a requirement for restrictions over the pipeline corridor during operation. No information is provided about soil handling and reinstatement following construction and/ or requirements for maintenance during operation. These matters should be addressed in the ES.</p> <p>The Inspectorate notes that National Policy Statement (NPS) EN-4, paragraph 2.23.7 requires information about mitigation measures for soil to be provided.</p> <p>The Inspectorate does not have sufficient information to agree that this matter can be scoped out of</p>	<p>Potential effects upon soils and agricultural land, including Best and Most Versatile (BMV) land, are assessed in Chapter 10: Geology, Hydrogeology and Contaminated Land (PEI Report, Volume I). This chapter will use these findings and assess them further for the socio-economic impacts of the potential effects on soils and agricultural land from the Proposed Development. This assessment is detailed in Section 18.6 Likely Impacts and Effects. This is assessed for all stages of the Proposed Development in this Chapter.</p> <p>Please refer to this and to Chapter 10: Geology, Hydrogeology and Contaminated Land (PEI Report, Volume I) for further detail on this assessment of the impacts.</p>



CONSULTEE	DATE AND METHOD OF CONSULTATION	SUMMARY OF CONSULTEE COMMENTS	SUMMARY OF RESPONSE/ HOW COMMENTS HAVE BEEN ADDRESSED
		assessment. It is also noted that paragraph 3.5.3 of the Scoping Report states that the pipeline could be above ground and it is unclear whether any BMV land would be permanently sterilised. The ES should provide an assessment of effects to BMV land and an explanation of how any loss of BMV land would be minimised or demonstrate that impacts would not give rise to likely significant effects, including evidence of agreement with relevant consultation bodies.	
	Scoping Opinion 17 th May 2023	The Scoping Report states that 2011 census data would be used. The Office for National Statistics (ONS) has commenced publication of 2021 census data and the Inspectorate advises that reference should be made to 2021 data where relevant to the assessment.	Census 2021 data has been incorporated into the baseline section of this PEI Report.
	Scoping Opinion 17 th May 2023	The Scoping Report does not reference potential impacts on housing during construction. It is noted that construction workforce peak will be approximately 3,100 people per day (paragraph 3.14.1 of the Scoping Report), but it is not stated whether these would be non-home-based workers or if there would be a requirement for temporary living accommodation. The Inspectorate advises that if a significant number of non-home-based construction workers are required, this could foreseeably have an impact on local availability of	The baseline section of the PEI Report provides information on the main housing settlements near the Proposed Development. Potential impacts on increased demand for accommodation are considered in Section 18.6. The area surrounding the Proposed Development is mostly industrial land; and does not contain any tourism businesses or major tourism sites. Therefore, an assessment has not been undertaken for the impact on tourism accommodation.



CONSULTEE	DATE AND METHOD OF CONSULTATION	SUMMARY OF CONSULTEE COMMENTS	SUMMARY OF RESPONSE/ HOW COMMENTS HAVE BEEN ADDRESSED
		<p>affordable housing, including from cumulative effects with other large developments nearby.</p> <p>The ES should provide an assessment of effects on the local private rented sector and tourist accommodation or demonstrate that impacts would not give rise to likely significant effects, including evidence of agreement with relevant consultation bodies.</p>	<p>For non-home-based construction workers, the assessment of employment effects in each stage of the Proposed Development considers the leakage of employment, whereby the proportion of employment originating from outside of the Wider Impact Area is considered. A value of 25% for leakage has been applied to gross construction job estimates, in line with HCA Additionality Guidance (HCA, 2014), as it is expected that the majority of employment in this stage will originate from the Middlesbrough and Stockton TTWA.</p> <p>In addition to this assessment, as part of the ES, the effects on the local private rented sector and temporary workers' accommodation will be further assessed for significance. This will include an assessment of available bedspaces and capacity in the private rented sector.</p>

Use of the Rochdale Envelope

18.3.16 To ensure a robust assessment of the likely significance of the environmental effects of the Proposed Development, the EIA is being undertaken adopting the principles of the “Rochdale Envelope” approach where appropriate in line with the Inspectorate’s Advice Note 9 (The Planning Inspectorate, 2012). This involves assessing the maximum (or where relevant, minimum) parameters for the elements where flexibility needs to be retained (building dimensions or operational modes for example). For example, through this Chapter, the minimum scenario will be assessed for employment, as it is envisioned to be a beneficial impact. In contrast, maximum parameters for impacts on other receptors (such as PRow and development land) will be assessed, whereby the ‘worst case scenario’ is considered, as the effect of the Proposed Development is expected to be an adverse impact.

18.4 Baseline Conditions

18.4.1 This section outlines the socio-economic baseline conditions in the Direct Impact Area, Wider Impact Area and England. The Direct Impact Area comprises of the LSOAs that the Proposed Development Site falls into, as detailed in Section 18.3. The Wider Impact Area is the Middlesbrough and Stockton TTWA. Both impact areas are shown in Figure 18-1. The local labour market in the Wider Impact Area is the main receptor for the assessment of employment effects. The baseline conditions help to determine the impact of employment generated by the Proposed Development, and the impact of the Proposed Development on the economy and other local businesses. The impact is mostly influenced by the size of the labour market and whether it has the relevant skills, occupations and sector strengths to access employment opportunities.

Existing Baseline

Population



Plate 18-1: Population Age Breakdown (H2Teesside Study Area, Middlesbrough and Stockton TTWA and England)

Source: Census 2021 Population Estimates (ONS, 2021a)

18.4.2 The Proposed Development Site is located within three local authorities, Redcar and Cleveland, Stockton-on-Tees, and Hartlepool. The population of the H2Teesside Study Area was 9,702 in 2021, which accounted for approximately 2% of the Middlesbrough and Stockton TTWA (ONS, 2021a). In the H2Teesside Study Area, 63% of the population are of working age³, which is in line with national averages and the TTWA. The proportion of elderly people (65+ years) in the H2Teesside Study Area (17%) is comparatively smaller than for the TTWA (21%), and nationally (18%), implying a smaller dependency ratio in the H2Teesside Study Area. This can be seen in Plate 18-1.

Skills

18.4.3 Data from the Census 2021 dataset, presented in Table 18-5, shows that there is a higher proportion of residents with no qualifications in the H2Teesside Area than regionally or nationally (ONS, 2021a). The data also show that the proportion of residents attaining a level 4 qualification (equivalent to degree level) or above is 20% in the H2Teesside Area, compared to 28% in the Middlesbrough and Stockton TTWA and 34% in England.

³ Between 16 and 64 years of age.

Table 18-5: Skills Profile

	H2TEESSIDE AREA	MIDDLESBROUGH AND STOCKTON TTWA	ENGLAND
No qualifications	25%	21%	18%
Level 1 and entry level qualifications	11%	10%	10%
Level 2 qualifications	15%	14%	13%
Apprenticeship	8%	7%	5%
Level 3 qualifications	19%	18%	17%
Level 4 qualifications or above	20%	28%	34%
Other qualifications	3%	3%	3%

Source: Census 2021 Highest Level of Qualification (ONS, 2021a)

Economic Activity Trends

- 18.4.4 Census 2021 data shows that in the H2Teesside Study Area, approximately 53% of the working age population are economically active, with the most common form of economic activity being full time employment (49%) (ONS, 2021a). Rates of economic activity are in line with the TTWA area (53%), but below national rates (59%). Of the economically active, approximately 4% are unemployed in the H2Teesside Study Area, compared to 3% for the TTWA and nationally. Among the economically inactive in the H2Teesside Study Area, the most common reason is retirement.

Deprivation

- 18.4.5 Multiple sections of the H2Teesside Study Area lie in areas of relative deprivation. Of the seven LSOAs within the H2Teesside Study area, four are in the most deprived decile nationally (MHCLG, 2019b). More widely, areas of deprivation are prevalent in the local authorities in which the H2Teesside Study Area resides, as Redcar and Cleveland and Stockton-on-Tees are ranked the 40th and 73rd most deprived local authorities nationally.

Employment by Industry

- 18.4.6 In the H2Teesside Study Area, manufacturing (Sector C, 21% of total employment) is the largest industry - this percentage is considerably larger than the Middlesbrough and Stockton TTWA average (9%) and national average (8%) (ONS, 2021a). The second largest industry is transport and storage (Sector H, 16%), followed by professional, scientific and technical (Sector M, 16%), both of which are higher percentages than the TTWA and national averages.

18.4.7 The industries of business administration and support services (Sector N, 11%), mining, quarrying & utilities (Sectors B, D and E respectively, 7%) and construction (Sector F, 7%) are comparatively higher for the H2Teesside Study Area than the TTWA and national averages. This compares to the percentages for education (Sector P, 3%), health (Sector Q, 2%) and accommodation and food services (Sector I, 1%) which are considerably lower for the H2Teesside Study Area than for the TTWA and national averages. These trends are shown in Plate 18-2.

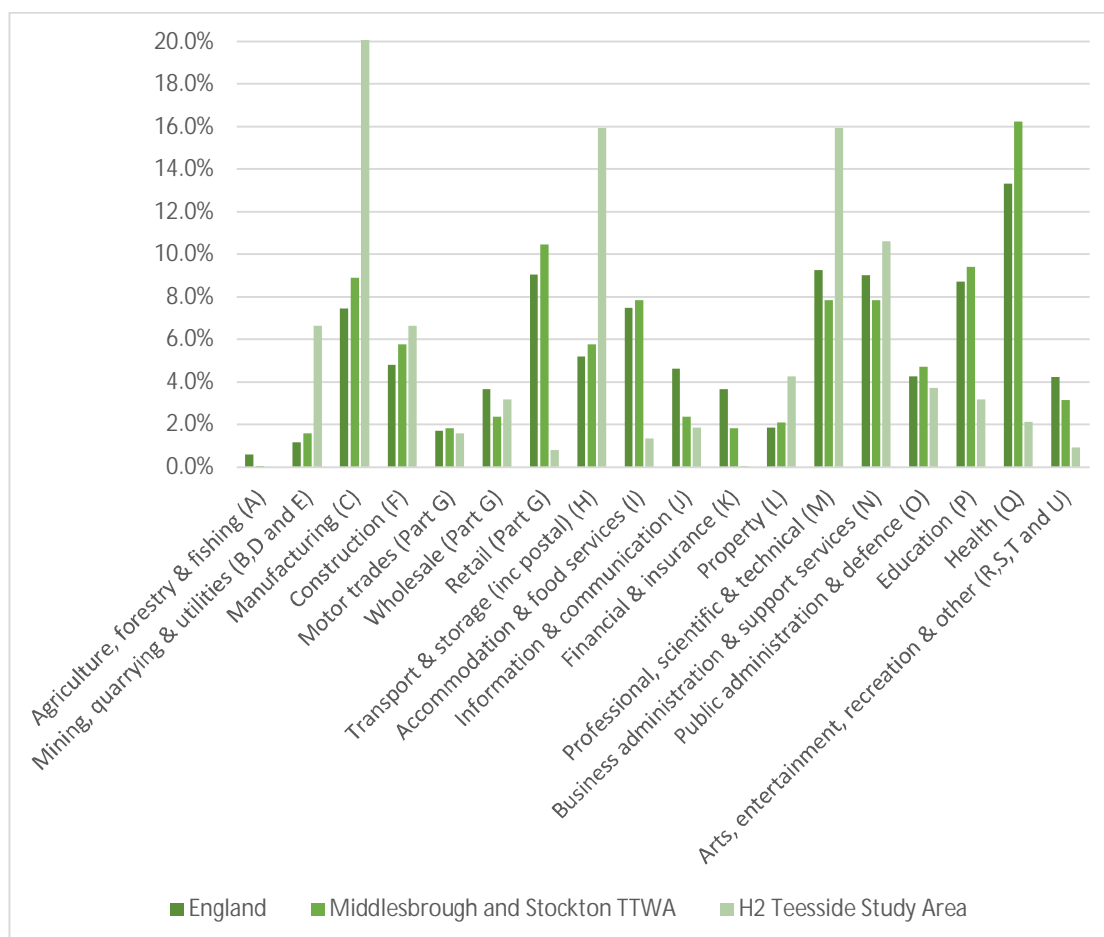


Plate 18-2: Employment by Industry (H2Teesside Study Area, Middlesbrough and Stockton TTWA and England)

Source: Office for National Statistics (ONS) Business Register and Employment Survey (BRES), 2021 (ONS, 2021a)

Land Use

18.4.8 The Proposed Development Site is located in a largely urban area, consisting of existing and former sites of industrial installations north and south of the River Tees. The Main Site is located on the former site of the materials handling area and associated plant for the neighbouring coke ovens and blast furnace of the Teesside Steelworks. The Connection Corridors south of the River Tees are located within or in proximity of the existing industrial area, generally following existing pipeline routes.



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- 18.4.9 The Connection Corridors north of the River Tees also generally follow existing pipeline routes within the existing industrial area, as well as extending into areas of open or agricultural land north and west of the existing industrial area.
- 18.4.10 Chapter 10: Geology, Hydrogeology and Contaminated Land (PEI Report, Volume I) provides a detailed baseline of the Natural England Agricultural Land Classification (ALC) map for the North East Region (ALC001) (Natural England, 2023), which is summarised here. Part of the Proposed Development Site, near Kirkleatham, is located within Grade 2 'Very Good' agricultural land. ALC Grades 1 to 3a are classified as "Best and Most Versatile" (BMV) land.
- 18.4.11 There are further areas of Grade 3 "Good to Moderate" (potentially BMV) agricultural land within the north-west of the Proposed Development Site, in the vicinity of Greatham. The remainder of the Proposed Development Site is located within areas of Grade 4 'Poor' or Grade 5 'Very Poor' agricultural land or non-agricultural land ('land predominantly in urban use' or 'other land primarily in non-agricultural use'), and not BMV.

Public Rights of Way

- 18.4.12 There are no PRoWs within the Main Site. The Teesdale Way long distance route runs adjacent to the northern boundary of the Main Site. However, there are multiple footpaths that lie within the boundary of the Proposed Development Site as detailed below and shown on Figure 3-1: Environmental Receptors within 1 km of the Proposed Development Site Boundary (PEI Report, Volume II):
- Bridleway 116/10/2, which runs along the eastern boundary of the Wilton International site, in Kirkleatham;
 - Footpaths 102/2A/1, 102/2A/2, 116/31/1, 116/31/2 and 116/31/3, which run adjacent to the Teesport Estate and Tees Dock Road;
 - Footpaths 102/2/1, 102/2/2 and 102/2/3 and bridleways 116/9/1 and 116/9/2, which are located to the south of the above footpaths and the Teesport Estate, and form part of the Teesdale Way long distance footpath and the England Coastal Path (Filey Brigg to Newport Bridge);
 - Footpath 31, which connects Cowpen Lane and Seal Sands Link Road;
 - An unnamed footpath, which runs along the railway line north of Claxton Beck, north-east of Cowpen Bewley Woodland Park; and
 - Three unnamed footpaths, which run north-east from Tees Road to Marsh House Lane; part of the southernmost of these is part of the England Coastal path (Newport Bridge to North Gare).
- 18.4.13 These PRoW may be affected by the selected routes of the hydrogen pipelines and other connections. In addition to the above, byway 30 is adjacent to the Proposed Development Site, north of Wolviston Back Lane. Bridleway 102/194/2 is located adjacent to the Proposed Development Site in Grangetown.
- 18.4.14 Footpaths 116/1/1, 116/1/2, 116/2/1, 116/37/1, 116/38/1 and 116/39/1 and bridleways 116/32/1, 116/33/1 and 116/36/1 are also located to the north-east of
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the Proposed Development Site, in Warrenby and Coatham. Bridleways 116/32/1 and 116/36/1 are the closest of this group to the Proposed Development Site; at the closest point (where they connect to the Teesdale Way long distance route), they are located approximately 310 m north-east of the Proposed Development Site. Bridleways 116/32/1 and 116/33/1 are part of the England Coastal Path (Filey Brigg to Newport Bridge).

Residential Properties

18.4.15 The Proposed Development Site is situated in a predominantly industrial area, with some agricultural land towards the north-west, near Billingham.

18.4.16 There are no residential areas within the Proposed Development Site or within 1 km of the site boundary. Marsh Farmhouse is the closest residential receptor to the Main Site, located approximately 1.3 km to the east in Warrenby. The nearest residential settlement to the Main Site is the town of Redcar (approximately 2.6 km east of the Main Site), including the borough of Dormanstown (approximately 1.3 km south-east of the Main Site).

18.4.17 The nearest residential settlements to the Connection Corridors are:

- Dormanstown, located approximately 0.4 km to the east of the Water Connections Corridor, approximately 0.7 km to the east of the Hydrogen Pipeline Corridor and Electrical Connection Corridor, approximately 0.9 km to the south-east of the Natural Gas Connection Corridor and approximately 0.9 km to the south-east of the CO₂ Export Corridors;
- Redcar, located approximately 1.8 km to the north-east of the Electrical Connection Corridor, approximately 2 km to the north-east of the Hydrogen Pipeline Corridor, approximately 2 km to the east of the Natural Gas Connection Corridor and Water Connections Corridor, and approximately 2 km to the-east of the CO₂ Export Corridors;
- Kirkleatham, which is to the immediate east of the Hydrogen Pipeline Corridor, where it extends into the Wilton International Estate;
- Billingham and Wolviston, located approximately 1.2 km south-west and 0.6 km west of the Hydrogen Pipeline Corridor's western extent respectively;
- Grangetown, adjacent to the Electrical Connection Corridor at its southern end; and
- Greatham, located approximately 0.6 km north-west of the Hydrogen Pipeline Corridor.

Business Premises

18.4.18 The Proposed Development Site is in proximity to multiple businesses, although there are none within its boundary. To the west of the River Tees, there are sites for Conoco Philips, Seal Sands, Intertek, Greenenergy Biofuels Teesside Ltd, KD Pharma Ltd, Lianhetech, Teesside Gas Processing Plant, Wood UK Ltd, Hertal Industrial Services, BOC Teesside Hydrogen and Oceaneering International Services.

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- 18.4.19 To the east of the River Tees, there are business premises located close to the docks, including a Tesco and ASDA distribution centre, Northumbrian Water, Kemira, BOC Ltd, PD Ports, Doosan Babcock, HM Customs and Excise and British Steel Lackenby.
- 18.4.20 Further to the east of the Proposed Development Site are the businesses located in Lazenby, including Hoggart Haulage, Falck Fire Services UK, Anglo American Wilton site, Talke UK, Viswalab UK PTE Limited, Wilton Power stations, Sembcorp Utilities UK, SUEZ recycling and recovery, Blue Phoenix, Wurth Trade Store, Telcoss, Algeco, Nippon Gases, Ensus and XPO Logistics.
- 18.4.21 The residential areas mentioned in the preceding section also contain a variety of businesses. To the east, there are clusters of businesses in Billingham and Stockton-on-Tees, and to the south in Middlesbrough city centre. To the east, many businesses are located in Redcar and Marske-by-the-Sea.

Education

- 18.4.22 There are no education facilities located within the Proposed Development Site, however, there are multiple schools within approximately 3 km of the Proposed Development Site boundary. The following schools are located in Redcar within 3 km of the Proposed Development Site:
- Coatham Primary School;
 - Redcar And Cleveland College;
 - Mo Mowlam Academy;
 - Sacred Heart Catholic Secondary School;
 - St. Benedict's Catholic Primary School;
 - Dormanstown Primary Academy;
 - Lakes Primary School;
 - Riverdale Primary School; and
 - Kirkleatham Hall School.
- 18.4.23 There are also schools within 3 km to the south of the Proposed Development Site in Middlesbrough:
- Wilton Primary Academy;
 - Grangetown Primary School;
 - Pathways School;
 - St. Peter's Catholic College; and
 - Caedmon Primary School.
- 18.4.24 To the west of the Proposed Development Site, there are a number of educational facilities in Billingham and Stockton-on-Tees:
- Bewley Primary School;

- St. Joseph's Catholic Primary School;
- Oakdene Primary School;
- Roseberry Primary School;
- Pentland Primary School; and
- St. Michael's Catholic Academy.

Community Facilities

18.4.25 Within 3 km of the Proposed Development Site there are a range of community and recreational facilities, as detailed in Table 18-6.

Table 18-6: Community Facilities Within 3 km of the Proposed Development Site

RECEPTOR	DESCRIPTION
<i>Churches</i>	
All Saints Church	Church in the town of Redcar
Christ Church, Coatham	Church in the town of Redcar
Sacred Heart Catholic Church	Church in the town of Redcar
South Bank Baptist Church	Church in Middlesbrough
St. Luke's Church	Church in the town of Billingham
St. Joseph's R C Church	Church in the town of Billingham
<i>Social Clubs and Community Centres</i>	
St. Williams Social Club	Social club in the town of Redcar
St. Marys Social Club	Social club in Middlesbrough
Cloud 9 Community Centre	Community centre to the east of Middlesbrough
Low Grange Community Centre	Community centre to the east of Billingham
Grangetown Youth and Community Centre	Youth and community centre to the east of Middlesbrough
Coatham Childrens Centre	Centre located in the village of Redcar
<i>Greenspace and Nature Reserves</i>	
Playing fields near Billingham	Playing fields south- west of the development site, adjacent to High Clarence Primary School
Coatham Green	Playing fields in the town of Redcar
Mannion Nature Park	Park to the east of Middlesbrough
Cowpen Bewley Woodland Park	Park to the west of the Proposed Development Site, north east of Billingham

RECEPTOR	DESCRIPTION
South Gare and Coatham Sands	Site of Special Scientific Interest (SSSI) to the west of Redcar
Saltholme East Pool	Nature reserve to the south- east of Billingham
Dorman Pool	Nature reserve to the south- east of Billingham
Paddy's Pool	Nature reserve to the south- east of Billingham
RSPB Saltholme	Nature reserve to the south- east of Billingham
Teemouth National Nature Reserve	Nature reserve to the north- west of the Proposed Development Site
<i>Other Recreational Facilities</i>	
The Lobster Inn	Pub in the town of Redcar
The Three Horseshoes	Pub to the east of the town of Billingham
Billingham Community Fire Station	Fire station in the town of Billingham
Haverton Hill Hotel	Hotel to the south- east of Billingham
Old Billingham Community Centre	Event venue in Stockton-on-Tees

Development Land

- 18.4.26 Parts of the Proposed Development Site lie within the boundary of the South Tees Development Corporation (STDC) area, which is now known as Teesworks. STDC is a Mayoral Development Corporation, established to further the economic development of the South Tees Area through physical, social and environmental regeneration. RCBC retains planning powers for the area and continues to act as the Local Planning Authority (LPA) in respect of planning policy and development management and the processing and determination of planning applications.
- 18.4.27 In September 2014, York Potash Ltd submitted a planning application for a mineral (polyhalite) granulation and storage facility involving the construction of buildings, conveyor systems, substations, water treatment plant, internal access roads, car parking, attenuation ponds, landscaping, restoration and aftercare, and construction of a tunnel portal including the landforming of spoil and associated works. The development is located approximately 0.3 km to the south of the Main Site. The application was granted in August 2015. Construction is currently underway.
- 18.4.28 Tees Combined Cycle Power Plant (CCPP) is a proposed gas-fired combined cycle gas turbine (CCGT) power station with a maximum generating capacity of up to 1,700 MW. It is proposed on approximately 15 hectares (ha) of land formerly used as a gas-fired generating station within the south-western part of the Wilton



International Complex, to the south of the Proposed Development Site. The DCO application was approved in April 2019, but is understood to be undergoing an amendment to enable development of the Whitetail project – a proposed 300 MW power plant at Sembcorp Energy UK's Wilton International site, with CCS. It is expected that construction of the Tees CCPP will begin in 2024, with the generating station becoming operational in 2027.

- 18.4.29 Redcar Energy Centre (REC) is a proposed material recovery facility incorporating a bulk storage facility, an energy recovery facility, and an incinerator bottom ash recycling facility along with ancillary infrastructure and landscaping, located to the immediate west of the Main Site. A planning application for REC was submitted in August 2020 and granted in January 2021. It was anticipated that construction would begin within approximately 15 months of the decision date, but construction is yet to begin.
- 18.4.30 In July 2016, CBRE submitted a planning application for an anaerobic biogas production facility and Combined Heat and Power (CHP) plant, south-east of the Main Site. This facility would involve the anaerobic digestion of mixed feedstock to create a biogas to be used as fuel in the CHP. Planning permission was granted in October 2016, but construction is yet to begin.
- 18.4.31 In September 2022, Tees Valley Lithium Ltd submitted a planning application for the construction of a lithium hydroxide monohydrate manufacturing plant and ancillary development (the "Tees Valley Lithium Project"), within the Wilton International Estate, Redcar. Planning permission was granted in November 2022. The development is located within the Wilton International estate, south-east of the Main Site. The development will be constructed on a phased basis and eventually comprise four process trains. Train 1 will employ a caustication process, whilst Trains 2, 3 and 4 will utilise an electrochemical process. It is anticipated that construction of Train 1 will be complete by Q4 2024, and construction of Trains 2, 3 and 4 will be complete by Q4 2025.
- 18.4.32 In July 2023, RCBC granted planning permission for the Green Lithium development programme within the Wilton International Chemicals Park in Teesside. This will support the development of commercial lithium in Europe. The project is expected to produce 50,000 tonnes of lithium hydroxide annually and generate approximately 1,200 construction jobs and approximately 250 operation jobs.
- 18.4.33 Off-site storage of hydrogen is not included within the Proposed Development Site. Should there be the requirement for off-site storage, it is expected that these would be owned and operated by a third-party provider who would be responsible for any consenting requirements. Details regarding this will be limited, with any potential developments being at a pre-planning stage, although the potential for cumulative effects will be assessed at a high level, based on available information. In the event any proposals come forward, these would be assessed from a CIA perspective for any relevant projects.

18.4.34 Within the Stockton-on-Tees Local Plan (STBC, 2019), a number of sites are identified for Specialist Employment Allocations (SDG4, EG4) and General Employment Allocations (SD4, EG1). These have not been proposed at this time.

Future Baseline

18.4.35 This section outlines future socio-economic baseline conditions. The future baseline conditions help to identify any changes anticipated to baseline conditions in the absence of the Proposed Development.

18.4.36 Data on future baseline conditions for the H2Teesside Study Area and the Middlesbrough and Stockton TTWA are not available as they have not been released for these areas by ONS. In the absence of these, data from the local authorities for Stockton-on-Tees and Redcar and Cleveland have been used to identify future employment patterns, as these local authorities most closely match the H2Teesside Study Area.

18.4.37 Table 18-7 shows population projections for these local authorities and shows that the resident population is expected to marginally increase in both local authorities between 2023 and 2043 (ONS, 2018). Between 2023 and 2043, the population of Stockton-on-Tees is expected to increase by approximately 1% (circa 2,000) to 202,000 to 2043, whilst the population of Redcar and Cleveland is expected to increase by 2% (circa 3,000) to 143,000. This is compared to an expected 7% (4,187,000) increase in England's population to 2043.

Table 18-7: Population Projections by Local Authority

YEAR	2023	2043	INCREASE (%)
STOCKTON-ON-TEES	199,465	201,186	0.9%
REDCAR AND CLEVELAND	139,201	142,548	2.3%
ENGLAND	57,557,526	61,744,108	6.8%

Source: Population Projections, ONS, 2018

18.4.38 Table 18-8 shows that, in both local authorities, the proportion of young people (0-15) is expected to fall by 2043, and both local authorities will experience an increasing population cohort aged 65 or over, which is in line with national trends. The proportions of the working age population are expected to fall by 3% between 2023 and 2043 for all geographies, highlighting that there is expected to be a higher dependency ratio in the future, at both a local and national level.

Table 18-8: Population Projections by Age

YEAR	AGE COHORT	2023	2043
STOCKTON-ON-TEES	0 to 15	18%	16%
	16 to 64	58%	55%
	65+	24%	29%
REDCAR AND CLEVELAND	0 to 15	20%	17%
	16 to 64	61%	58%
	65+	20%	25%
ENGLAND	0 to 15	19%	17%
	16 to 64	62%	59%
	65+	19%	24%

Source: Population Projections, ONS, 2018

18.4.39 In terms of the local economy, it would be reasonable to expect that employment and Gross Value Added (GVA) will increase, associated with the expected increase in population over time. However, this is likely to be restrained by the reduction in the working age population in the future.

18.4.40 It is expected that PRow in the area will continue to be used. Businesses and community facilities may open and close. However, it is not expected that there will be any perceptible changes to the local economic baseline. Therefore, the Proposed Development should be assessed against current baseline conditions and policies. These changes are not considered to constitute significant changes to the existing baseline.

18.5 Proposed Development Design and Impact Avoidance

18.5.1 The EIA process aims to avoid, prevent, reduce or offset potential environmental effects through design and/or management measures. These are measures that are inherent in the design and construction of the Proposed Development (also known as 'embedded measures'). Embedded mitigation measures, as applicable to this assessment, include minimising impacts on the PRow that cross the Proposed Development Site.

18.5.2 Construction methods will also be selected that aim to minimise local disruption. For example, several options are being considered for the hydrogen pipeline crossing under the River Tees, including the construction of new trenchless crossings (in pipelines or tunnels) or the repurposing of existing pipelines or tunnels (where feasible). Although subject to ongoing studies (engineering and environmental), the construction methodology most likely to be used for the crossing of the River Tees will be a Micro Bored Tunnel (MBT). This methodology would ensure that disruption to users of surrounding area is reduced as far as reasonably practicable.

18.5.3 Further details of the measures which will be implemented will be included in a Framework Construction Environmental Management Plan (CEMP) which will form



part of the ES. The Final CEMP will be prepared by the Contractor prior to construction in accordance with the Framework CEMP. A Construction Traffic Management Plan (CTMP) will also be implemented to control the impact of HGVs on the local road network during construction. A Framework CTMP will be prepared and included with the ES.

18.6 Likely Impacts and Effects

18.6.1 This section identifies the likely impacts and effects on socio-economics and land use resulting from the Proposed Development. This section considers construction, operation and decommissioning phases.

18.6.2 Each section is split to first show the assessment of potential employment impacts, before detailing other potential socio-economic impacts associated with the Proposed Development.

Construction

18.6.3 The following section estimates gross construction employment arising from the Proposed Development and accounts for leakage displacement and multiplier effects (to define the indirect and induced employment) to assess net impacts on the sub-regional and national economies.

Construction Employment

18.6.4 Construction is anticipated to commence in 2025 and will be split into two phases. Phase 1 will last approximately three years, with Phase 2 commencing thereafter for another two years, with overall construction expected to be completed by 2030 (refer to Chapter 5: Construction Programme (PEI Report, Volume I)). This four-year period will generate employment opportunities in construction, which will represent a temporary positive economic impact for the area. This is through the direct expenditure involved in the construction phase, which will lead to increased output generated in the Middlesbrough and Stockton TTWA economy.

18.6.5 As detailed in Chapter 5: Construction Programme and Management (PEI Report, Volume I), based on an initial estimate, it is considered likely that construction workforce peak numbers would be approximately 1,300 direct and indirect construction workers per day in both Phases 1 and 2. However, given that the employment assessment will assess the minimum scenario, the minimum number of direct and indirect construction workers has been estimated at 900 based on minimum estimates for the construction phase of the Proposed Development. This is assumed as the minimum for both Phase 1 and Phase 2 of the construction period.

Leakage

18.6.6 Leakage effects refer to the proportion of jobs within an Impact Area that are filled by residents living outside the Impact Area (i.e., outside the Wider Impact Area, defined as the Middlesbrough and Stockton TTWA). Overall, it is assumed that the majority of the employment generated would be occupied by people living in the Middlesbrough and Stockton TTWA and as such leakage effects are considered to be low. Leakage has been set at 25% in line with the guidance from HCA Additionality

Guide (HCA, 2014). A 25% discount is applied to the estimated 900 gross direct and indirect jobs created. As such it is anticipated that approximately 225 workers from outside the Middlesbrough and Stockton TTWA and approximately 675 workers from within the TTWA would benefit from working at the Proposed Development Site during the construction period.

Displacement

- 18.6.7 Displacement measures the extent to which the benefits of a given project are offset by reductions of output or employment elsewhere. Any additional demand for labour cannot simply be treated as a net benefit – it removes workers from other posts and the net benefit is reduced to the extent that this occurs.
- 18.6.8 Overall, it is assumed that due to the flexibility of a typical construction workforce (i.e., they quickly move from project to project) displacement effects are considered to be low. The HCA Additionality Guide (HCA, 2014) suggests 25% as a ‘ready reckoner’ for low levels of displacement (i.e., there are expected to be some displacement effects, although only to a limited extent). Applying this level of displacement to total gross direct employment results in net direct and indirect employment estimate of 675.

Multiplier Effect

- 18.6.9 Multiplier estimates have been applied to the jobs estimate prior to this assessment by the operator of the Proposed Development, which resulted in the original figure of 900 gross direct and indirect jobs.

Net Construction Employment

- 18.6.10 Based on the gross construction worker requirements in the construction schedule and the additionality factors outlined above, it is estimated that 675 net construction jobs would be generated by the construction of the Proposed Development, of which around 506 are expected to be from the Middlesbrough and Stockton TTWAs.
- 18.6.11 Table 18-9 summarises the net construction employment arising from the Proposed Development’s construction phase, in the Middlesbrough and Stockton TTWA.

Table 18-9: Net Construction Employment in Middlesbrough and Stockton TTWA (Average Number Of Workers Onsite Per Year)

EMPLOYMENT IMPACTS	WITHIN MIDDLESBROUGH AND STOCKTON TTWA	OUTSIDE MIDDLESBROUGH AND STOCKTON TTWA	TOTAL
GROSS DIRECT AND INDIRECT EMPLOYMENT	675	225	900
LESS DISPLACEMENT	169	56	225



EMPLOYMENT IMPACTS	WITHIN MIDDLESBROUGH AND STOCKTON TTWA	OUTSIDE MIDDLESBROUGH AND STOCKTON TTWA	TOTAL
NET DIRECT AND INDIRECT EMPLOYMENT	506	169	675
TOTAL NET EMPLOYMENT	506	169	675

18.6.12 The sensitivity of the receptors in the vicinity of the Proposed Development Site is considered High, and the magnitude of the impact of the Proposed Development Site upon employment during the construction phase is considered Low. This is because the net employment generated by the Proposed Development in the Middlesbrough and Stockton TTWA represents 5% of total employment in construction for the area. Therefore, this results in a medium-term, temporary Moderate Beneficial effect, which is considered Significant.

Wider Impacts and Effects during the Construction Phase

18.6.13 This section considers the wider likely socio-economic effects during the Proposed Development construction phase – refer to Table 18-10. These contrast in detail and level of confidence from the impacts on employment, as the wider effects require further inputs at this time. Given the length of the construction phase, the duration of these potential impacts is considered medium term.

Table 18-10: Likely Wider Socio-economic Impacts and Effects in the Proposed Development Construction Phase

RECEPTOR	POTENTIAL IMPACT(S)	POTENTIAL EFFECTS	LIKELY SIGNIFICANCE OF EFFECT
Agricultural and industrial land	<ul style="list-style-type: none"> Land take required to construct the Proposed Development 	<ul style="list-style-type: none"> Temporary loss of open space; Temporary land take; and Potential for noise and vibration, air quality and visual effects arising from construction activities associated with the construction on the Proposed Development Site. 	Given that industrial and agricultural land lie close to the Proposed Development Site, the effect of the Proposed Development Site has the potential to be Minor Adverse, but not Significant.
PRoW	<ul style="list-style-type: none"> Land take required to construct the Proposed Development 	<ul style="list-style-type: none"> Temporary loss of open space; Potential temporary disruption of access to residences during and after construction; and Potential temporary disruption of access to visitor attractions or open space leading to impact on residents' physical activity and health. 	The effect of the Proposed Development Site on recreational routes and PRoW during the construction phase has the potential to be Minor Adverse, but not Significant.
Private assets (resident and business premises)	<ul style="list-style-type: none"> Land take required to construct the Proposed Development Construction activities in proximity to private and community facilities as a result of the Proposed Development 	<ul style="list-style-type: none"> Temporary land take of private assets; Potential for noise and vibration, air quality and visual effects arising from construction activities associated with the construction of the Proposed Development Site to impact on the amenity of residential and business premises; and Potential temporary disruption of access to residences during and after construction. 	There are no residential properties within the boundary of the Proposed Development Site, but many businesses lie close by. Based on the information currently available, the effect of the Proposed Development has the potential to be Minor Adverse, but not Significant.
Education and community facilities			There are some educational and community facilities within proximity of the Proposed Development Site. The effect of the Proposed



RECEPTOR	POTENTIAL IMPACT(S)	POTENTIAL EFFECTS	LIKELY SIGNIFICANCE OF EFFECT
			Development has the potential to be Minor Adverse, but not Significant.
Development land	<ul style="list-style-type: none"> Land take required to construct the Proposed Development 	<ul style="list-style-type: none"> Potential severance to development land at housing and employment site allocations during construction Potential land take of development land through construction activities at the Proposed Development Site. 	There are multiple planning applications or permissions within the vicinity of the Proposed Development Site that do not correspond to the development itself. However, the potential for the impacts at the Proposed Development Site on this receptor are expected to be minimal, and therefore, this has the potential to be Minor Adverse, but not Significant.
Temporary workers' accommodation	Increased demand for accommodation in the construction phase.	<ul style="list-style-type: none"> Positive impacts for the local economy through additional demand for local businesses. Negative impacts through increased rental costs from an increased demand in the rental market. 	Though there is likely to be a reasonable in-flow of construction workers to the project, this pool of accommodation will likely benefit from the medium-term increase in usage. However, negative impacts on the increased cost of temporary and rental accommodation on the existing local population is also acknowledged and could outweigh the positive benefit. Therefore, it is anticipated that this will result in an overall Minor Adverse, but not Significant effect.
Demographic effects and community disruption	Increase in construction workers from the construction phase	<ul style="list-style-type: none"> Potential change in the demographic characteristics of the local area. Potential disruption to community facilities and activities. 	The sensitivity has been assessed as Medium due to the ability of the local population and community to generally have a moderate capacity to experience these impacts without incurring a change on their economic well-



RECEPTOR	POTENTIAL IMPACT(S)	POTENTIAL EFFECTS	LIKELY SIGNIFICANCE OF EFFECT
			<p>being. No significant difference from baseline conditions is expected in relation to demand for local services, such as schools or health services, during the construction phase, and therefore no additional provision of local services or infrastructure is required. Therefore, the magnitude has been assessed as Low. A Minor Adverse, but not Significant effect is anticipated on the demographic characteristics of the local area.</p>



18.6.14 A full assessment will be undertaken and reported in the Environmental Statement (ES) together with mitigation measures where practicable.

Operation

Net Operational Employment

18.6.15 The Proposed Development would generate long-term jobs once the operational phase has commenced. This section details the operational employment estimates arising from the Proposed Development, and takes into account the additionality factors (deadweight, leakage, displacement and multiplier effects) to assess the net impacts in the Middlesbrough and Stockton TTWA.

18.6.16 Following the completion of the construction stage, the operational stage is expected to last for 25 years for the Phase 1 elements, and a total of 28 years for the Phase 2 elements. The operational life of the Proposed Development Site could last longer should the market conditions and plant condition remain favourable.

18.6.17 Gross operational employment will be a minimum level assessed for both Phases of the Proposed Development, which has been assessed to be 60 gross direct jobs.

Leakage and Displacement

18.6.18 As with the construction employment, additionality values have been used to estimate the net operational employment. These include a 25% leakage figure (a low ready reckoner from the HCA Additionality Guide (HCA, 2014)), and a 25% displacement figure (a low ready reckoner from the HCA Additionality Guide).

Multiplier Effects

18.6.19 In addition to the direct operation employment generated by the Proposed Development itself, there will be an increase in local employment arising from indirect and induced effects of the operation activity, which can be calculated for the operational phase. Employment growth will arise locally through manufacturing services and suppliers to the Proposed Development (indirect or supply linkage multipliers). Additionally, part of the income of the operational workers and suppliers will be spent in the Middlesbrough and Stockton TTWA, generating further employment (induced or income multipliers).

18.6.20 The impact of the multiplier depends on the size of the geographical area that is being considered, the local supply linkages and income leakage from the area. The HCA Additionality Guide (HCA, 2014) provides '*ready reckoners*' of composite multipliers – the combined effect of indirect and induced multipliers. It has been assumed that the Middlesbrough and Stockton TTWA has '*average*' supply linkages based on the scale of its economy. A multiplier of 1.3 is determined from the HCA guidance.

Net Operational Employment

18.6.21 As with the construction employment, additionality values have been used to estimate the net operational employment. These include a 25% leakage figure (a low ready reckoner from the HCA Additionality Guide (HCA, 2014)), a 25% displacement figure (a low ready reckoner from the HCA Additionality Guide), and a multiplier of 1.3 (a multiplier for "*average*" supply linkages in the economy of the Middlesbrough



and Stockton TTWA, from the HCA Additionality Guide). Accounting for these additionality values, it is estimated that there would be 58 net jobs, with 44 of these filled by residents of the Middlesbrough and Stockton TTWA. A breakdown of additionality factors is shown in Table 18-11. This is a Medium sensitive receptor, and an impact of Low magnitude, resulting in a Minor Beneficial effect (Not Significant).

Table 18-11: Net Operational Employment in Middlesbrough and Stockton TTWA (Average Number of Workers Onsite Per Year)

	WITHIN MIDDLESBROUGH AND STOCKTON TTWA	OUTSIDE MIDDLESBROUGH AND STOCKTON TTWA	TOTAL
Gross Direct Employment	45	15	60
Less displacement	11	4	15
Net Direct Employment	34	11	45
Net Indirect/ Induced Employment	10	3	13
Total Net Employment	44	14	58

Wider Impacts and Effects during the Operational Phase

18.6.22 This section considers the wider likely socio-economic effects during the Proposed Development operational phase – refer to Table 18-12. These contrast in detail and level of confidence from the impacts on employment, as the wider effects require further inputs at this time. Given the length of the operational phase, the duration of any potential impacts is considered long term. A full assessment will be undertaken and reported in the ES together with mitigation measures where practicable.



Table 18-12: Likely Wider Socio-economic Impacts and Effects in the Proposed Development Operational Phase

RECEPTOR	POTENTIAL IMPACT(S)	POTENTIAL EFFECTS	LIKELY SIGNIFICANCE OF EFFECT
Agricultural and industrial land	<ul style="list-style-type: none"> • Potential land take in the operational phase. 	<ul style="list-style-type: none"> • Permanent loss of agricultural and industrial land. 	Given that industrial and agricultural land lie close to the Proposed Development Site, the effect of the Proposed Development has the potential to be Minor Adverse, but not Significant.
PRoW	<ul style="list-style-type: none"> • Potential land take in the operational phase. 	<ul style="list-style-type: none"> • Potential permanent disruption of access to residences during and after construction; and • Potential permanent disruption of access to visitor attractions or open space leading to impact on residents' physical activity and health. 	The effect of the Proposed Development Site on recreational routes and PRoW for the operational phase is likely to be Minor Adverse, but not Significant.
Private assets (resident and business premises)	<ul style="list-style-type: none"> • Potential land take in the operational phase. • Potential disruption and congestion impacts from the operational workforce at the Proposed Development. 	<ul style="list-style-type: none"> • Permanent land take; and • Potential permanent disruption of access to residences from operational activities. 	There are no residential properties within the boundary of the Proposed Development Site, but many businesses lie close by. However, the Proposed Development Site does not involve any land take of these premises. Furthermore, the operational activities of the site are not likely to cause disruption to socio-economic activities for residents in private assets. Therefore, based on current information, the effect of the Proposed Development is likely to be Negligible and not Significant.



RECEPTOR	POTENTIAL IMPACT(S)	POTENTIAL EFFECTS	LIKELY SIGNIFICANCE OF EFFECT
Education and community facilities	<ul style="list-style-type: none"> • Potential land take in the operational phase. • Potential disruption and congestion impacts from the operational workforce at the Proposed Development. 	<ul style="list-style-type: none"> • Permanent land take; and • Potential permanent disruption of access to educational and community facilities from operational activities. 	There are some educational and community facilities within proximity of the Proposed Development Site. However, the Proposed Development Site does not involve any land take of these facilities through the operational phase. Therefore, the effect of the operational phase of the Proposed Development is likely to be Negligible and not Significant.
Development land	<ul style="list-style-type: none"> • Potential land take in the operational phase. • Potential disruption and access impacts from the operational workforce at the Proposed Development. 	<ul style="list-style-type: none"> • Potential severance to development land at housing and employment site allocations during the operation phase. • Potential land take of development land resulting from construction and operation activities at the Proposed Development Site. 	There are multiple planning applications or permissions within the vicinity of the Proposed Development Site that do not correspond to the development itself. The effect of the Proposed Development Site has the potential to be Minor Adverse, but not Significant.



Decommissioning

- 18.6.23 The Production Facility would have a design life of 25 years for each Phase. However, the operational life could be longer subject to market conditions and plant condition. At the end of its operational life, the most likely scenario would be that the Proposed Development Site would be shut down, with all above ground structures on the Main Site removed, and the ground remediated as required to facilitate future re-use. The same timescales would apply for the hydrogen pipeline and connections.
- 18.6.24 It is often the case that sufficient information is not available at the time of assessment to inform an assessment of decommissioning impact. However, it is generally assumed that the effects associated with decommissioning will be no worse than those experienced during construction. As such, socio-economic effects during Proposed Development decommissioning are likely to be similar to the construction effects as identified in Tables 18-9 and 18-10. Likely employment effects during decommissioning are anticipated to be temporary Moderate Beneficial. A full assessment will be undertaken and reported in the ES with mitigation measures suggested where practicable.
- 18.7 Mitigation and Enhancement Measures
- 18.7.1 No significant adverse socio-economic effects are predicted during the construction, operation and decommissioning of the Proposed Development. As such no specific mitigation is required. No other additional mitigation measures, over and above those stated in the other technical chapters of this PEI Report are required to avoid or minimise the socio-economic effects identified in this chapter.
- 18.8 Limitations and Difficulties
- 18.8.1 This assessment is based on baseline and design information available at the time of writing this PEI Report (August 2023). A full assessment is being undertaken as part of the EIA and will be reported in the ES that will be submitted with the DCO Application.
- 18.8.2 The assessment of the significance of effects has been carried out against a benchmark of current socio-economic baseline conditions prevailing around the Proposed Development Site, as far as is possible within the limitations of such a dataset. Baseline data is also subject to a time lag between collection and publication. As with any dataset, these conditions may be subject to change over time which may influence the findings of the assessment.
- 18.8.3 The assessment of likely socio-economic effects arising from the Proposed Development is based on professional judgement, drawing on relevant guidance as set out in Section 18.3 which considers both potential beneficial and adverse impacts that the Proposed Development is likely to have on socio-economic receptors.
- 18.8.4 As a result of the long time period prior to the decommissioning phase, the confidence of assessment of all effects in this stage is currently low, as the baseline for socio-economic effects cannot yet be ascertained. Therefore, no judgement on



significance has been passed for potential effects related to the decommissioning stage, except for employment effects.

18.9 Residual Effects and Conclusions

18.9.1 It is considered that the Proposed Development would have an overall positive economic effect on the Middlesbrough and Stockton TTWA economy, through the provision of employment and through associated multiplier effects.

18.9.2 The residual effects associated with the Proposed Development during the construction, operational and decommissioning stages are summarised in Table 18-13.

18.9.3 As explained in Table 18-4, through the responses to the Scoping Opinion, the effects on the local private rented sector and tourist accommodation will be further assessed for significance as part of the ES.

Table 18-13: Residual Socio-economic Effects

EFFECT	EFFECT CLASSIFICATION	EXPLANATION
CONSTRUCTION AND DECOMMISSIONING PHASES		
Construction employment	Moderate Beneficial (Significant – construction phase ⁴)	High sensitivity, Low magnitude
Agricultural and industrial land	Minor Adverse (Not Significant)	Medium sensitivity, Low Magnitude
PRoW	Minor Adverse (Not Significant)	Medium sensitivity, Low magnitude
Private assets (resident and business premises)	Minor Adverse (Not Significant)	Medium sensitivity, Low magnitude
Education and community facilities	Minor Adverse (Not Significant)	Medium sensitivity, Low magnitude
Development land	Minor Adverse (Not Significant)	Medium sensitivity, Low Magnitude
Temporary workers' accommodation	Minor Adverse (Not Significant)	Medium sensitivity, Low Magnitude
Demographic effects and community disruption	Minor Adverse (Not Significant)	Medium sensitivity, Low Magnitude
OPERATIONAL PHASE		
Operation employment	Minor Beneficial (Not Significant)	Medium sensitivity, Low magnitude

⁴ Because of the long time period prior to the decommissioning phase, the confidence of this assessment is currently low, therefore, no judgement on significance has been passed at this stage for decommissioning phase employment effects.



EFFECT	EFFECT CLASSIFICATION	EXPLANATION
Agricultural and industrial land	Minor Adverse (Not Significant)	Medium sensitivity, Low magnitude
PRoW	Minor Adverse (Not Significant)	Medium sensitivity, Low magnitude
Private assets (residential and business premises)	Negligible (Not Significant)	Low sensitivity, Low magnitude
Education and community facilities	Negligible (Not Significant)	Low sensitivity, Low magnitude
Development land	Minor Adverse (Not Significant)	Medium sensitivity, Low magnitude



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