FIVE ESTUARIES
OFFSHORE WIND FARM

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ENVIRONMENTAL STATEMENT

VOLUME 6, PART 4, CHAPTER 2 : HUMAN HEALTH AND MAJOR DISASTERS

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DEFINITION OF ACRONYMS

Term	Definition
ALARP	As Low as Reasonably Practicable
AQOs	Air Quality Objectives
BESS	Battery energy storage scheme
CEA	Cumulative Effects Assessment
CoCP	Code of Construction Practice
CSIP	Cable Specification and Installation Plan
CTMP	Construction Traffic Management Plan
DCO	Development Consent Order
EACN	East Anglia Connection Node
ECC	Export Cable Corridor
EEAST	East of England Ambulance Service
EIA	Environmental Impact Assessment
EIA Regulations	Infrastructure Planning EIA Regulations 2017
EMF	Electro-magnetic fields
EPA 1990	Environmental Protection Act 1990
ES	Environmental Statement
ESNEFT	East Sussex & North East Essex Foundation Trust
ETG	Expert Technical Group
GHG	Greenhouse Gas
H&S	Health and Safety
HDD	Horizontal Directional Drilling
HIA	Health Impact Assessment
IEMA	Institute of Environmental Management and Assessment
JHWB	Joint Health and Wellbeing Strategy 2018 – 2022
LSE	Likely Significant Effects
LSOAs	Lower Super Output Areas
MARPOL	International Convention for the Prevention of Pollution from Ships

Term	Definition
MDS	Maximum Design Scenario
NMU	Non-Motorised User
NPFF	National Planning Policy Framework
NPS	National policy statement
NSIP	National Significant Infrastructure Projects
OHID	Office for Health Improvement and Disparities
OnSS	Onshore substation
PAMP	Public Access Management Plan
PHE	Public Health England
PPG	Planning Practice Guidance
ProW	Public Rights of Way
TDC	Tendring District Council
VE	Five Estuaries Offshore Wind Farm
WFD	Water Framework Directive
WHO	World Health Organisation

GLOSSARY OF TERMS

Term	Definition
Baseline	The status of the environment at the time of assessment without the development in place.
Biodiversity Net Gain	An approach to development that leaves biodiversity in a measurably improved state than it was previously. Where a development has an impact on biodiversity, developers are encouraged to provide an increase in appropriate natural habitat and ecological features over and above that being affected, to ensure that the current loss of biodiversity through development will be halted and ecological networks can be restored.
Cable ducts	A duct is a length of underground piping which is used to house the Cable Circuits.
Cumulative effects	The combined effect of VE acting additively with the effects of other projects, on the same single receptor/resource.
Cumulative impact	Impacts that result from changes caused by other past, present or reasonably foreseeable actions together with VE.
Development Consent Order (DCO)	An order made under the Planning Act 2008 granting development consent for a NSIP.
Effect	Term used to express the consequence of an impact. The significance of an effect is determined by correlating the magnitude of the impact with the sensitivity of the receptor, in accordance with defined significance criteria.
EIA Directive	European Union 2011/92/EU (as amended by Directive 2014/52/EU).
EIA Regulations	Infrastructure Planning (Environmental Impact Assessment) Regulations 2017.
Environmental Impact Assessment (EIA)	A statutory process by which certain planned projects must be assessed before a formal decision to proceed can be made. It involves the collection and consideration of environmental information, which fulfils

Term	Definition
	the assessment requirements of the EIA Regulations, including the publication of an ES.
Environmental Statement (ES)	The suite of documents that detail the processes and results of the EIA.
Evidence Plan	A voluntary process of stakeholder consultation with appropriate Expert Topic Groups that discusses and, where possible, agrees the detailed approach to the Environmental Impact Assessment (EIA) and information to support Habitats Regulations Assessment for those relevant topics included in the process, undertaken during the pre-application period.
Export cables	High voltage cables which transmit power from the Offshore Substations to the Onshore Substation via the Offshore Reactive Compensation Platform if required, which may include one or more auxiliary cables (normally fibre optic cables).
Haul Road	The track within the onshore ECC which the construction traffic would use to facilitate construction.
Impact	An impact to the receiving environment is defined as any change to its baseline condition, either adverse or beneficial.
Intertidal	The area between Mean High-Water Springs (MHWS) and Mean Low Water Springs (MLWS).
Landfall	The location at the land-sea interface where the offshore export cables and fibre optic cables will come ashore.
Mitigation	Mitigation measures are commitments made VE to reduce and/or eliminate the potential for significant effects to arise as a result of the VE.
National Policy Statement (NPS)	A document setting out national policy against which proposals for Nationally Significant Infrastructure Projects will be assessed and decided upon.

Term	Definition
Onshore Export Cable Corridor (ECC)	The Onshore Export Cable Corridor is the area within which the export cables running from the landfall to the onshore substation will be situated.
Onshore Infrastructure	The combined name for all onshore infrastructure associated with VE from landfall to grid connection.
Onshore substation (OnSS)	VE's onshore substation, containing electrical equipment, control buildings, lightning protection masts, communications masts, access, fencing and other associated equipment, structures or buildings; to enable connection to the National Grid.
Order Limits	The area subject to the application for development consent. The limits shown on the works plans within which VE may be carried out.
Pre-construction and post-construction	The phases of VE before and after construction takes place.
Preliminary Environmental Information Report (PEIR)	The PEIR was written in the style of a draft Environmental Statement and provided information to support and inform the statutory consultation process during the pre-application phase.
Project Design Envelope	A description of the range of possible elements that make up VE's design options under consideration, as set out in detail in the project description. This envelope is used to define VE for Environmental Impact Assessment purposes when the exact engineering parameters are not yet known. This is also often referred to as the "Rochdale Envelope" approach.
Receptor	A distinct part of the environment on which effects could occur and can be the subject of specific assessments. Examples of receptors include species (or groups) of animals or plants, people (often categorised further such as 'residential' or those using areas for amenity or recreation), watercourses etc.

Term	Definition
Statutory consultee	Organisations that are required to be consulted by the Applicant, the Local Planning Authorities and/or The Planning Inspectorate during the pre-application and/or examination phases, and who also have a statutory responsibility in some form that may be relevant to VE and the DCO application. This includes those bodies and interests prescribed under Section 42 of the Planning Act 2008.
Study Area	Area(s) within which environmental impact may occur – to be defined on a receptor-by-receptor basis by the relevant technical specialist.
The Applicant	Five Estuaries Offshore Wind Farm Ltd (VE OWFL). The Applicant making the application for a DCO.
The Planning Inspectorate	The agency responsible for operating the planning process for Nationally Significant Infrastructure Projects.
Trenchless technique	Trenchless technology is an underground construction method of installing, repairing, and renewing underground pipes, ducts and cables using techniques which minimize or eliminate the need for excavation. Trenchless technologies involve methods of new pipe installation with minimum surface and environmental disruptions. These techniques may include Horizontal Directional Drilling (HDD), thrust boring, auger boring, and pipe ramming, which allow ducts to be installed under an obstruction without breaking open the ground and digging a trench.
VE	The Project.
Vulnerable Groups	Hard to reach groups as defined by the EIA Regulations, Pyper, 2022.

2 HUMAN HEALTH AND MAJOR DISASTERS

2.1 INTRODUCTION

OVERVIEW

2.1.1 This Chapter of the Environmental Statement (ES) has been prepared by SLR and presents the results of the Environmental Impact Assessment (EIA) for the potential impacts of Five Estuaries Offshore Wind Farm (here after referred to as VE) on Human Health and Major Disasters. Specifically, this Chapter considers the potential impact of VE from the Landfall, along the Onshore Export Cable Corridor (ECC), and incorporating the onshore substation (OnSS) during the construction, operation and maintenance, and decommissioning phases.

2.1.2 The Chapter includes an assessment of potential impacts, the significance of effects, the requirements for mitigation and the residual and cumulative effects. The assessment has considered the existing baseline and in particular vulnerable and sensitive populations in line with Government policy and in particular 2022 EIA guidance. In terms of assessing the impact of the Offshore aspect of VE on Human Health, it is considered not significant this is due to the Offshore aspect of VE being out of the radius of potential human health receptors. This aspect has therefore been excluded from the assessment.

2.1.3 The aim of this Chapter is to meet the requirements of the EIA Regulations (Regulation 5(2) and paragraph 4 of Schedule 4) by providing conclusions for the identification and assessment of any Likely Significant Effects (LSE) of VE on human health receptors. The consideration of health and well-being matters are inherent within a number of the technical assessments presented within this ES and specific policies apply to specific topic areas and impacts. Where impacts have already been assessed in another chapter further policy information should be sought in the relevant chapter.

2.1.4 A Scoping Report was submitted to the Secretary of State (Planning Inspectorate) on 5th October 2021 and a Scoping Opinion was adopted by the Secretary of State in November 2021.

2.1.5 This Chapter brings together the relevant information on health, including assessing the findings of other chapters within this ES in terms of population health. This approach aims to assist in identifying project factors which may affect human health and wellbeing.

2.1.6 This Chapter should be read alongside the following chapters:

- Volume 6, Part 3, Chapter 3: Socioeconomics, Tourism and Recreation;
- Volume 6, Part 3: Chapter 5: Ground Conditions and Land Use;
- Volume 6, Part 3, Chapter 6: Hydrology, Hydrogeology and Flood Risk;
- Volume 6, Part 3, Chapter 8: Traffic and Transport;
- Volume 6, Part 3, Chapter 9: Airborne Noise and Vibration;
- Volume 6, Part 3, Chapter 10: Air Quality;
- Volume 6, Part 4, Chapter 1: Climate Change; and
- Volume 9, Report 11: Equality Impact Assessment.

2.1.7 Additional information to support the health baseline and assessment has also been collated and can be found within:

- Volume 6, Part 4, Chapter 2, Annex 2.1: Human Health Baseline; and
- Volume 6, Part 4, Chapter 2, Annex 2.2: Human Health Literature Review.

2.1.8 The construction, operation, and decommissioning of any major project has potential to affect the health, well-being, and quality of life of the people who live and work in the area. This study aims to predict these impacts and to avoid or reduce their occurrence by considering them in the environmental assessment and in the design process. This Chapter presents the results of the study on the likely significant health impacts that may arise as a result of the construction, operation, and decommissioning of VE.

PURPOSE OF THE HEALTH CHAPTER

2.1.9 The purpose of this Chapter is to identify and assess the potential positive or negative effects in health and wellbeing arising from VE. In addition to considering impacts on the health of the existing local community, this Chapter identifies appropriate mitigation and recommendations as necessary to minimise any potential negative health impacts. This Chapter has been prepared in accordance with established good practice for major energy infrastructure projects in the UK.

2.1.10 There is now a recognition that public health is the outcome of a number of different, interrelated factors, not just health services. This Chapter can help the development of VE by identifying potential impacts, identifying ways in which negative impacts can be mitigated and benefits maximised.

2.1.11 Following best practice (Pyper et al .2022), this Chapter considers health effects with regards to the general population and vulnerable population groups. Populations are considered at regional and local levels. The advice acknowledges that EIA includes some aspects of health, for example consideration of human receptors in relation to air or water quality and noise or light disturbance. Furthermore, the socio-economics chapter (Volume 6, Part 3, Chapter 3: Socioeconomics, Tourism and Recreation) includes the implications on public services (including health services), education and employment.

2.1.12 It is important to note that there is no fixed method for assessing human health in this context. This Chapter follows the World Health Organisation (WHO) definition of health as:

"a state of complete physical, mental, and social wellbeing and not merely the absence of disease or infirmity."(Source: Constitution of the World Health Organization 1948, as amended).

2.1.13 Similarly, it also considers issues of wellbeing as:

"a state in which every individual realises his or her own potential, can cope with the normal stresses of life, can work productively and fruitfully, and is able to contribute to their community."(Source: WHO online page on Health and well-being - https://www.who.int/data/gho/data/major-themes/health-and-well-being)

2.1.14 The context of people's lives determines their health. Therefore, both the WHO and Public Health England (PHE) consider that health and wellbeing are influenced by a range of factors, termed the 'wider determinants of health'. Determinants include the social and economic environment, the physical environment, and individual characteristics or behaviours.

2.1.15 The focus of this Chapter is on community health and wellbeing and not on occupational health and safety. Occupational health and safety falls under 'safety' which is the responsibility of an employer. The effect of work on health and that of health on work is considered for each individual. As discussed in the accompanying Code of Construction Practice (CoCP) (document ref: Volume 9, Report 21), appropriate industry standards will be adopted and implemented for the health, safety and welfare of the construction staff while onsite and arrangements will be in place for the discharge of duties under the Construction (Design and Management) Regulations 2015 (or updated as appropriate).

2.1.16 The Principal Contractor for the onshore works will develop a Construction Phase Plan which will address the safety of construction workers, visitors to the site and the general public for the works. The Construction Phase Plan will set out how all health and safety risks are identified and managed in accordance with legal requirements and current best practice for each stage of the onshore works.

2.1.17 Appropriate Personal Protective Equipment (PPE) will be worn by construction workers including sub-contractors. The term 'health' is used to describe 'human health' and 'wellbeing' unless specifically referenced otherwise.

2.2 STATUTORY AND POLICY CONTEXT

LEGISLATIVE AND POLICY CONTEXT

2.2.1 This section identifies legislation, guidance, national and local policy of particular relevance to the potential impact on public health associated with the construction, operation, and decommissioning of VE.

2.2.2 The following legislative context has informed the assessment:

- The Health and Safety at Work Act 1974 (UK Government, 1974) places duties on employers to ensure, so far as is reasonably practicable: the health, safety, and welfare at work of all their employees; and that persons not in their employment are not exposed to risks to their health or safety as a result of the activities undertaken. In both cases, the requirement for risks to be reduced to 'As Low As Reasonably Practicable' (ALARP) is fundamental and applies to all activities within the scope of the Health and Safety at Work Act 1974;
- The Control of Major Accident Hazards Regulations 1999 relate to the management of threshold quantities of dangerous substances identified in the regulations (UK Government, 1999);
- The Public Health (Control of Disease) Act 1984, which was substantially amended by the Health and Social Care Act 2008 is complemented by three sets of regulations. These are:
  - The Health Protection (Notification) Regulations 2010 (SI 2010/659);
  - The Health Protection (Local Authority Powers) Regulations 2010 (SI 2010/657); and

- The Health Protection (Part 2A Orders) Regulations 2010 (SI 2010/658).
- The Clean Air Act 1993 aims to reduce pollution from smoke, grit and dust and gives local authorities powers to designate smoke control areas (UK Government, 1993). The Air Quality Standards Regulations 2010 transpose into English law the requirements of Directives 2008/50/EC and 2004/107/EC on ambient air quality;
- Part III of the Environmental Protection Act 1990 discusses control of emissions (including dust, noise, and light) that may be prejudicial to health or a nuisance (UK Government, 1990);
- The International Convention for the Prevention of Pollution from Ships (MARPOL) includes regulations aimed at preventing and minimising, both accidental and operational, pollution from ships (International Maritime Organisation, 1973);
- The revised Bathing Water Directive 2006/7/EC safeguards public health and clean bathing waters (European Parliament and Council of the European Union, 2006). Bathing waters are also protected under the Water Framework Directive 2000/60/EC (European Parliament and Council of the European Union, 2000); and
- The Planning Act 2008, Infrastructure Planning EIA Regulations 2017 (EIA Regulations), Environment Act 1995, and Environment Act 2021 have also been considered along with the more specific legislation relevant to health.

NATIONALLY SIGNIFICANT INFRASTRUCTURE PROJECTS (NSIPS)

2.2.3 This section identifies legislation, guidance, national and local policy of particular relevance to the potential impact on public health associated with the construction, operation and decommissioning of VE.

2.2.4 Planning policy on offshore renewable energy Nationally Significant Infrastructure Projects (NSIPs) is provided by the National Policy Statements (NPSs) EN-1 'Overarching National Policy Statement for Energy' (the Department for Energy Security and Net Zero (DESNZ, 2023) and EN-3 'National Policy Statement for Renewable Energy Infrastructure' (DESNZ, 2023) and EN-5 'National Policy Statement for Electricity Networks Infrastructure' (DESNZ, 2023).

2.2.5 The NPS are a series of principal decision-making documents to appropriately assess NSIPs. As such, this assessment has made explicit reference to the relevant NPS requirements.

2.2.6 Taking into account the above, this assessment has made explicit reference to the relevant NPS requirements.

2.2.7 The relevant legislation and planning policy for offshore renewable energy NSIPs, specifically in relation to Human Health, is outlined in Table 2.1. These provide the primary basis for the recommendations made by the Planning Inspectorate (the Inspectorate) to the Secretary of State for DESNZ on applications for development consent for nationally significant renewable energy projects.

2.2.8 The National Planning Policy Framework (NPPF) is also relevant to the policy context of renewable energy NSIPs and the relevant policy is outlined in Table 2.1. The NPPF sets the framework for planning policy in England, and states that the purpose of the planning system is to contribute to the achievement of sustainable development. The three stated dimensions to sustainable development - economic, social and environmental - include building a strong, responsive economy, identifying and coordinating development requirements including the provision of infrastructure, supporting strong, vibrant and healthy communities by providing the supply of housing required to meet the needs of present and future generations, and by creating a high quality built environment with accessible local services that reflect the community's needs and support its health, social and cultural well-being.

2.2.9 The Planning Practice Guidance (PPG) is another relevant resource for the policy context and relevant sections from the Healthy and Safe Communities Guidance[1] are outlined in Table 2.1. The PPG is a web-based resource and that is updated as necessary. The section on design provides advice on issues including a network of greenspaces (including parks) and public places, access and inclusion and cohesive and vibrant neighbourhoods. It also sets out what makes for a well-designed place, which includes ensuring the community has easy access to facilities such as shops, schools, clinics, workplaces, parks, play areas, pubs, or cafés. This helps achieve multiple benefits from the use of land, and encourage a healthier environment, reducing the need for travel and helping greater social integration.

2.2.10 Relevant policy is outlined in Table 2.1.

1 Department for Levelling Up, Housing and Communities, and Ministry of Housing, Communities & Local Government, Guidance: Healthy and safe communities, 2022

Table 2.1 Policy Context

Legislation/ Policy	Paragraph	Key Provisions	Section where comment is addressed
Overarching National Policy Statement for Energy (EN-1)	4.1.7	> EN-1 sets out the national policy for the delivery of energy infrastructure, including offshore renewable electricity generation. > Paragraph 4.1.7 states that: "where this NPS or the relevant technology-specific NPSs require an applicant to mitigate a particular impact as far as possible, but the Secretary of State considers that there would still be residual adverse effects after the implementation of such mitigation measures, the Secretary of State should weigh those residual effects against the benefits of the proposed development. For projects which qualify as CNP Infrastructure, it is likely that the need case will outweigh the residual effects in all but the most exceptional cases > This presumption, however, does not apply to residual impacts which present an unacceptable risk to, or interference with, ***human health*** and public safety, defence, irreplaceable habitats, or unacceptable risk to the achievement of net zero."	> An overview of mitigation that is relevant to health is set out in Table 2.15. > Sections 2.10 – 2.11 assesses the impact of the following health effects across the construction, operation, and maintenance stages of VE: Construction > Noise; > Air Quality; > Ground/Water Contamination; > Physical Activity; and > Journey Times/Reduced Access. Construction and Operation > Employment. > Construction and Maintenance > Noise; > Wider Societal Benefits. It should be noted that the possible health effects arising from the decommissioning of VE are considered to be similar in scale and nature to those considered here for construction. > within the conclusions provides a summary of the residual health effects.
Overarching National Policy Statement for Energy (EN-1)	4.3.1 -4.3.2	> Paragraph 4.3.1 advises that all proposals for projects that are subject to the Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (the EIA Regulations) must be accompanied by an ES describing the aspects of the environment likely to be significantly affected by the project. > Paragraph 4.3.2 goes on to state that "the Regulations specifically refer to effects on population, ***human health***, biodiversity, land, soil, water, air, climate, the landscape, material assets and cultural heritage, and the interaction between them."	> This Chapter has been prepared in line with the EIA guidance, as per paragraph 4.3.1 of EN-1. > To inform the significance of effects the following Annexes have been prepared which provide an overview of the baseline population: > Volume 6, Part 4, Chapter 2, Annex 2.1: Human Health Baseline; and > Volume 6, Part 4, Chapter 2, Annex 2.2: Human Health Literature Review Baseline Statistics. > Interactions with other disciplines (such as noise and air quality) are considered within the impacts assessment (Sections2.10 – 2.12). Table 2.21 provides a summary of the residual health effects. > The relationship with health regarding major disasters which includes future climate scenarios is considered within Section 2.16.
Overarching National Policy Statement for Energy (EN-1)	4.3.4.	> Paragraph 4.3.4 states: "to consider the potential effects, including benefits, of a proposal for a project, the applicant must set out information on the likely significant environmental, social, and economic effects of the development, and show how any likely significant negative effects would be avoided, reduced, mitigated, or compensated for, following the mitigation hierarchy. This information could include matters	> Sections 2.10 – 2.12 assess the impact of the following health effects across the construction, operation, and maintenance stages of VE: Construction > Noise; > Air Quality; > Ground/Water Contamination;

Legislation/ Policy	Paragraph	Key Provisions	Section where comment is addressed
		such as employment, equality, biodiversity net gain, community cohesion, health, and well-being."	> Physical Activity; and > Journey Times/Reduced Access. Construction and Operation > Employment. > Construction and Maintenance > Noise; > Wider Societal Benefits. It should be noted that the possible health effects arising from the decommissioning of VE are considered to be similar in scale and nature to those considered here for construction. The effects assessed consider potential benefits, and environmental, social, and economic effects of the development, and show how any likely significant negative effects would be avoided, reduced, mitigated, or compensated for, following the mitigation hierarchy. > Table 2.21 provides a summary of the residual health effects.
Overarching National Policy Statement for Energy (EN-1)	4.4.4-4.4.6	> Section 4.4 of EN-1 relates to energy infrastructure potentially having a negative impact on some people's health. > Paragraphs 4.4.4 – 4.4.6 state that: "as described in the relevant sections of this NPS and in the technology specific NPSs, where the proposed project has an effect on humans, 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. > The impacts of more than one development may affect people simultaneously, so the applicant should consider the cumulative impact on health in the ES where appropriate. > Opportunities should be taken to mitigate indirect impacts, by promoting local improvements to encourage health and wellbeing, this includes potential impacts on vulnerable groups within society, and impacts on those with protected characteristics under the Equality Act 2010, i.e. those groups which may be differentially impacted by a development compared to wider society as a whole."	> All elements of VE are considered within the impact assessment in Sections 2.10 – 2.12. The impact of VE has also considered the following effects across each stage of the project: Construction > Noise; > Air Quality; > Ground/Water Contamination; > Physical Activity; and > Journey Times/Reduced Access. Construction and Operation > Employment. > Construction and Maintenance; > Noise; and > Wider Societal Benefits. It should be noted that the possible health effects arising from the decommissioning of VE are considered to be similar in scale and nature to those considered here for construction. Cumulative effects are considered within Section 2.14. An overview of mitigation that is relevant to human health is set out in Table 2.15. This outlines relevant mitigation set out in other ES chapters.
Overarching National Policy Statement for Energy (EN-1)	5.2.3	> Paragraph 5.2.3 states that "for many air pollutants there is not a threshold below which there is no health impact so it is important that energy infrastructure schemes consider not just how a scheme may impact statutory air quality limits, objectives or targets but also measures to mitigate all emissions in order to minimise human exposure to air pollution, especially for those who are more susceptible to the impacts of poor air quality."	> Air quality is considered in the impact assessment (Section 2.12) during the construction phase.
Overarching National Policy Statement for Energy (EN-1)	5.11.6	> Paragraph 5.11.6 states that "the government's policy is to ensure there is adequate provision of high quality open space and sports and recreation facilities to meet the needs of local communities. Connecting	Tendring DC's Proposals Map does designate an area of land affected by the construction works as being 'safeguarded open space'. This area

Legislation/ Policy	Paragraph	Key Provisions	Section where comment is addressed
		people with open spaces, sports and recreational facilities all help to underpin people's quality of life and have a vital role to play in promoting healthy living."	of land is discussed in the accompanying draft Statement of Reasons (Document Reference 4.3). It should be noted that VE will have no permanent impact on the land and VE will not result in the loss of the whole or part of areas designated as Safeguarded Open Space. Any impact will be limited to temporary Horizontal Directional Drilling (HDD) under it. > Effects upon recreational and cultural facilities and services the community needs are considered with the impact assessment (Section 2.10– 2.12) and the summary of effects (Section 2.19) outlines that there are no significant effects.
Overarching National Policy Statement for Energy (EN-1)	5.12.1 and 5.12.6	> Paragraph 5.12.1 states that "excessive noise can have wide-ranging impacts on the quality of human life and, health (for example owing to such as annoyance or, sleep disturbance), cardiovascular disease and mental ill-health. It can also have an impact on the environment, and the use and enjoyment of areas of value such as quiet places and areas with high landscape quality." > Paragraph 5.12.6 goes on to advises that where noise impacts are likely to arise from the proposed development, the applicant should include the following in the noise assessment in relation to health: > an assessment of the effect of predicted changes in the noise environment on any noise-sensitive receptors, including an assessment of any likely impact on health and quality of life / well-being where appropriate, and particularly among those disadvantaged by other factors who are often disproportionately affected by noise-sensitive areas. > It goes on to advise that all reasonable steps taken to mitigate and minimise potential adverse effects on health and quality of life.	> Noise is considered in the impact assessment (Sections 2.10 and 2.12) during both the construction phase and maintenance phase.
Overarching National Policy Statement for Energy (EN-1)	5.15.1	> Paragraph 5.15.1 states that "Government policy on hazardous and non-hazardous waste is intended to protect human health and the environment by producing less waste and by using it as a resource wherever possible. Where this is not possible and disposal is required as a last resort, waste management regulation ensures that waste is disposed of in a way that is least damaging to the environment and to human health."	> Section 2.4 which outlines the topic scope outlines the impacts on human health due to soil emissions which include hazardous waste and substances have been scoped out of the assessment.
Overarching National Policy Statement for Energy (EN-5)	2.9.46 and 2.11.10	> EN-5 taken together with the Overarching National Policy Statement for Energy (EN-1), provides the primary policy for decisions taken by the Secretary of State on applications it receives for electricity networks infrastructure. > With regards to health, Part 2.9.46 advises that all overhead power lines produce EMFs. These tend to be highest directly under a line and decrease to the sides at increasing distance. Although putting cables underground eliminates the electric field, they still produce magnetic fields, which are highest directly above the cable. EMFs can have both direct and indirect effects on human health, aquatic and terrestrial organisms.	> Section 2.4 which outlines the topic scope, outlines the impacts on health due to exposure to Electromagnetic fields (EMFs) (all phases) which have been scoped out of the assessment. This is due to the export cables in proposal which will be placed underground. > Section 2.3 provides an overview of VEs consultation relating to health considered in the production of this.

Legislation/ Policy	Paragraph	Key Provisions	Section where comment is addressed
		> Paragraph 2.11.10 goes on to state that "before granting consent to an overhead line application, the Secretary of State should be satisfied that the proposal is in accordance with the guidelines, considering the evidence provided by the applicant and any other relevant evidence. It may also need to take expert advice from the Department of Health and Social Care." that the proposal is in accordance with the guidelines, considering the evidence provided by the applicant and any other relevant evidence. It may also need to take expert advice from the Department of Health and Social Care."	
NPPF (2023) Section 8. Promoting healthy and safe communities	Paragraph 96	Planning policies and decisions should aim to achieve healthy, inclusive and safe places and beautiful buildings which: > promote social interaction, including opportunities for meetings between people who might not otherwise come into contact with each other – for example through mixed-use developments, strong neighbourhood centres, street layouts that allow for easy pedestrian and cycle connections within and between neighbourhoods, and active street frontages; > are safe and accessible, so that crime and disorder, and the fear of crime, do not undermine the quality of life or community cohesion – for example through the use of beautiful, well-designed, clear and legible pedestrian and cycle routes, and high quality public space, which encourage the active and continual use of public areas; and > enable and support 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, access to healthier food, allotments and layouts that encourage walking and cycling.	The impact assessment (Sections 2.10– 2.12) and summary of effects (Section 2.19) show that there are **no significant** residual adverse effects in EIA terms regarding health and that VE has the potential to have wider societal benefits.
NPPF Section 8. Promoting healthy and safe communities	Paragraph 97	To provide the social, recreational and cultural facilities and services the community needs, planning policies and decisions should: > plan positively for the provision and use of shared spaces, community facilities (such as local shops, meeting places, sports venues, open space, cultural buildings, public houses and places of worship) and other local services to enhance the sustainability of communities and residential environments; take into account and support the delivery of local strategies to improve health, social and cultural well-being for all sections of the community; > guard against the unnecessary loss of valued facilities and services, particularly where this would reduce the community's ability to meet its day-to-day needs; > ensure that established shops, facilities and services are able to develop and modernise, and are retained for the benefit of the community; and > ensure an integrated approach to considering the location of housing, economic uses and community facilities and services.	Effects upon recreational and cultural facilities and services the community needs are considered with the impact assessment (Sections 2.10 - 2.12) and the conclusions. Table 2.21 outlines that overall, there are no significant effects.
PPG Healthy and Safe Communities		"It is helpful if the Director of Public Health is consulted on any planning applications (including at the pre-application stage) that are likely to have a	Consultation in relation to human health is outlined within Section 2.33. Mitigation is set out in Table 2.4.

Legislation/ Policy	Paragraph	Key Provisions	Section where comment is addressed
		significant impact on the health and wellbeing of the local population or particular groups within it. This would allow them to work together on any necessary mitigation measures. A health impact assessment may be a useful tool to use where there are expected to be significant impacts; Information gathered from this engagement should assist local planning authorities consider whether the identified impact(s) could be addressed through planning conditions or obligations. Alternatively, local planning authorities may decide the identified need could be funded through the Community Infrastructure Levy". "Planning and health need to be considered together in two ways: in terms of creating environments that support and encourage healthy lifestyles, and in terms of identifying and securing the facilities needed for primary, secondary and tertiary care, and the wider health and care system (taking into account the changing needs of the population)."	Policy and guidance relating to health that has be produced by relevant local authorities is outlined in Table 2.2.

2.2.11 NPS EN-1 (Paragraph 4.1.12) advises that other matters that the Secretary of State may consider both important and relevant to their decision-making may include Development Plan documents or other documents in the Local Development Framework. In addition, Paragraph 4.1.13 states:

"Where the project conflicts with a proposal in a draft Development Plan, the Secretary of State should take account of the stage which the Development Plan document in England or Local Development Plan in Wales has reached in deciding what weight to give to the plan for the purposes of determining the planning significance of what is replaced, prevented, or precluded."

2.2.12 VEs area falls under the authority of Tendring District Council and Essex County Council which are listed below, alongside the most pertinent guidance with their authority boundaries:

- Tendring District Council
  - Tendring District Local Plan 2013-2033 and Beyond: North Essex Authorities' Shared Strategic Section 1.
  - Tendring District Local Plan 2013-2033 and Beyond: Section 2.
- Essex County Council
  - Everyone's Essex: Our Plan for levelling up the county 2021-2025.

2.2.13 It is important to recognise that all Local Planning Authorities encourage Developers to consider health as part of development proposals. This is realised within Paragraphs 4.1-4.4.10 of the Tendring Local Plan: Section 2 which highlights the importance of health and wellbeing. The Local Plan's strategic objective for Healthcare Needs are 'to work with partners in the National Health Service, local health organisations and local community groups to ensure adequate provision of healthcare facilities to support growing communities'

2.2.14 In addition, the Essex County Council's 'Everyone's Essex: our plan for levelling up the County 2021 to 2025' highlights health as a key area to work on, stating they 'will aim to increase the proportion of people able to live healthy lifestyles by embedding a community-first approach, by helping people to overcome social isolation, mental ill health and substance misuse, and by helping people to live fit and active lifestyles'.

2.2.15 Alongside the plans discussed above, the authorities have also set out additional guidance/plans related to health. These have all been taken into account in the preparation of this assessment and are outlined below alongside the plans already discussed for completeness.

Table 2.2: Relevant local policy and guidance to health

Policy/guidance	Relevance to health
Tendring District Local Plan 2013-2033 and Beyond: North Essex Authorities' Shared Strategic Section 1.	Paragraph 6.22 states: ''Local authorities have a role in creating a healthy community. The North Essex Authorities will work closely with relevant stakeholders such as the NHS, Public Health and local health partnerships, developers and communities to ensure that future development in North Essex takes into account the need to improve health and wellbeing of local residents (and workers) including access to appropriate health and care infrastructure to support new and growing.''
	Policy SP6-Infrastrcuture and Connectivity sets out provisions related to health, as listed below: > Healthcare infrastructure will be provided as part of new developments of appropriate scale in the form of expanded or new facilities including primary and acute care; pharmacies; dental surgeries; opticians; supporting community services including hospices, treatment and counselling centres. > Require new development to maximise its positive contribution in creating healthy communities and minimise its negative health impacts, both in avoidance and mitigation, as far as is practicable. > The conditions for a healthy community will be provided through the pattern of development, good urban design, access to local services and facilities; green open space and safe places for active play and food growing, and which are all accessible by walking, cycling and public transport
Tendring District Local Plan 2013-2033 and Beyond: Section 2.	Objection 5 of the Local plan sets out the local plans overarching vision for health which seeks to encourage health lifestyles through engagement with public bodies such as Public Health to ensure that developments and planning provide residents opportunities for such lifestyles. Section 4 also sets out 5 health related policies that will all play a role to *''create and support vibrant, sustainable and healthy communities''*.

Policy/guidance	Relevance to health
	Policy HP1- Improving Health and Wellbeing set out several provisions to improve the health and well-being of residents within Tendring. This includes: > Working in partnership with NHS and Public Health; > Requiring a Health Impact Assessment (HIA) for certain types of schemes; and > Encouraging healthier communities through targeting unhealth lifestyles.
	Policy HP2- Community Facilities states "the Council will work with the development industry and key partners to deliver and maintain a range of new community facilities.'' The council also recognise the role such facilities can play in promoting positive health and well-being
	Policy HP3-Green Infrastructure sets out provisions that are required for the protection and enhancement of existing green infrastructure within the region. The policy also outlines that a good green infrastructure network can: "improve residents' health and wellbeing by creating a more attractive environment for people to actively use.''
	Policy HP4-Open Space sets out the provisions that are required for open space and in the relation to health, it is recognised that such amenity is *"essential in improving public health, well-being and quality of life"*.
	Policy HP5- Open Space, Sport and Recreation Facilities sets out the provision for open space, sport and recreation facilities and like the previous policy listed above, it is recognised that these amenities can have positive health impacts.
Everyone's Essex: Our Plan for levelling up the county 2021-2025.	Within the Everyone's Essex: Our Plan for levelling up the county 2021-2025, health is one of four focus areas that seeks to improve the quality of life its residents. In relation to health, the following aims/deliverables are setting out within the plan > To increase the proportion of people able to live healthy lifestyles; > To promote independence by working with key partners and the adult safeguarding board to

Policy/guidance	Relevance to health
	help individuals to live free from abuse and neglect; > To deliver better care that meets the needs of residents by joining up care and support with local partners in a place, including with district councils, health partners and the local voluntary and community sector. > To help those carers of all ages whose caring duties are impacting most on their wellbeing by achieving a step change in the advice, guidance and support we provide to support wellbeing and independence, and by targeting it at those who need it most. > To level up health by reducing inequalities and bringing together partners and communities to address the socio-economic drivers that underpin poor health outcomes, such as poor housing, poverty, economic insecurity and low skills
Essex Healthier Places Guidance: Advice Notes for Planners, Developed and Designers, and The Essex Design Guide: Health Impact Assessments (Essex Planning Officers Association, 2019)	This planning guidance provides information around what the planning system should address within the environment to support better health and wellbeing in the Essex population.
Essex Joint Health and Wellbeing Strategy (JHWS) 2022 - 2026 (Essex County Council, 2022)	The Essex Joint Health and Wellbeing Strategy sets out a number of key strategic priorities for action to have positive impacts on health. The overarching aim of the strategy is to see an ‘‘improvement in health and wellbeing outcomes for people of all ages, and a reduction in health inequalities, by having a focus on supporting poor health prevention and promoting health improvement.’’ To reach this long-term ambition, there are five priority areas of focus, as follows: 1. Improving mental health and wellbeing 2. Physical activity and healthy weight 3. Supporting long term independence

Policy/guidance	Relevance to health
	4. Alcohol and substance misuse 5. Health inequalities and the wider determinants of health
Essex Joint Strategic Needs Assessment (JNSA): Tendring District Profile (Essex County Council, 2019)	This guidance provide data which will be used to contribute to the overall the health and wellbeing of residents, in order to highlight areas of inequality and identify opportunities to improve the healthy lives for residents.
Essex Healthier Places Guidance: Advice Notes for Planners, Developed and Designers, and The Essex Design Guide: Health Impact Assessments (Essex Planning Officers Association, 2019)	This guidance notes ‘‘provides information around what the planning system should address within the built and natural environment to support the population of Essex to enjoy better health and wellbeing through the places that they work, live and play. The guidance and Health Impact Assessment tool has been endorsed by the Essex Planning Officers Association for use by designers, planners and developers.’’
Guidance Note: Health Impact Assessments (HIA’s) (Essex Planning Officers Association, 2019)/	The guidance note sets out the purpose and need to carry out HIA’s as well as guidance on how the assessments should be carried out within the Essex region.
Essex Health Places: Updated Checklist 2023	This document provides a checklist to enable HIAs to be produced in detail by applicants. Guidance is divided into specific sections which include: > Landscape and greenspaces; > Layout design; > Street and Roads; > Internal Design Details; and > Architectural Details.

NATIONAL GUIDANCE

2.2.16 Regard has been given to the advice provided in the Institute of Environmental Management and Assessment (IEMA), 2022 Health in Environmental Assessment, a primer for a proportionate approach (IEMA, 2022). Public Health England (PHE) has also issued a briefing note on health in EIA for local public health teams and a guide on Health Impact Assessments in spatial planning (PHE, 2017a; PHE, 2020b).

2.2.17 Other relevant national guidance considered is outlined in Table 2.3.

Table 2.3: Relevant national guidance

Policy/guidance	Relevance to health
Planning Practice Guidance: Healthy and safe communities (MHCLG 2019b)	The guidance promotes and encourages healthy and safe communities
PPG on EIA (May 2020)	The guidance explains the requirements of the Town and Country Planning (Environmental Impact Assessment) Regulations 2017.
Health Impact Assessment of Government Policy: A guide to carrying out a Health Impact Assessment of new policy as part of the Impact Assessment process (Department of Health 2010)	This guide provides advice to support policy makers decide the level of HIA their policy requires and how to carry out such assessments.
Healthy Urban Planning Checklist (NHS London Health Urban Development Unit 2017)	This checklist promotes healthy urban planning by ensuring that the health and wellbeing implications of local plans and major planning applications are consistently taken into account. The checklist should be used by developers to screen and scope the health impacts of development proposals.
Health Impact Assessment: A Practical Guide (Wales) (WHIASU 2012)	This guide, produced by the Wales Health Impact Assessment Support Unit describes the process, provides methods and lists resources to support Health Impact Assessment (HIA). HIA is a process that considers how the health and well-being of a population may be affected by a proposed action, be it a policy, programme, plan, project or a change to the organisation or delivery of a particular public service.
Health Impact Assessment Guidance (Northern Ireland) (Metcalfe et al., 2009)	The guidance provides advise and tools to conduct HIAs based on the experience of practitioners. It aims to provide a user friendly and practical framework to guide not only policy makers but those developing specific proposals through the HIA process and to enable them to undertake a HIA.
The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (EIA Regulations 2017)	The EIA regulations update in 2017 clarified that 'populations and human health' was to be included in the list of topics to be considered within an EIA.

Policy/guidance	Relevance to health
Health Impact Assessment of Rural Development: a Guide. Scottish Health and Inequalities Impact Assessment Network and Scottish Public Health Network (Higgins et al., 2015)	This guide helps practitioners inform health impact assessment of proposed developments and other partnership work that addresses health impacts relating to a range of types of development in rural settings.
Environmental, Health, and Safety Guidelines for Wind Energy (World Bank Group 2015).	The guidance advises that community health and safety hazards specific to wind energy include blade or ice throw, aviation impacts, marine navigation, electromagnetic fields, public access, and abnormal load transportation. Blade or ice throw impacts are unlikely to impact on local populations along the onshore cable corridor(s) due to the distance of the projects from the coast.
Health and Safety at Work Act 1974	the Act sets a duty on employers to ensure, so far as is reasonably practicable, the health, safety and welfare at work of all their employees. Similarly, employers must also ensure, so far as is reasonably practicable, that persons not in their employment are not exposed to risks to their health or safety as a result of activities being undertaken.
The Health Protection (Notification) Regulations 2010	Under the Public Health (Control of Disease) Act 1984, as amended by the Health and Social Care Act 2008, a suite of new regulations, The Health Protection (Notification) Regulations came into effect in April 2010, covering notifications, local authority powers and Part 2A Orders.
Clean Air Act 1993	The Act establishes measures to reduce pollution from smoke, grit and dust and gives local authorities powers to designate smoke control areas (HM Government of Great Britain & Northern Ireland, 1993).
Environmental Protection Act 1990 (EPA 1990)	Established a system of industrial process regulation and control on emissions. Part III of the EPA 1990 sets out control of emissions (including dust, noise and light) that may be prejudicial to health or a nuisance (HM Government of Great Britain & Northern Ireland, 1990).
Environment Act 1995	The Act places a duty on Authorities to review air quality and to designate Air Quality Management Areas where health-based

Policy/guidance	Relevance to health
	standards are not met. The Air Quality (England) Regulations 2000 laid down ambient air quality standards for a range of air pollutants.
International Convention for the Prevention of Pollution from Ships (MARPOL) 1973	Regulations aimed at preventing and minimising, both accidental and operational, pollution from ships are included in the MARPOL (International Maritime Organisation, 1973).
Bathing Water Directive 2006/7/EC	The revised Bathing Water Directive 2006/7/EC safeguards public health and clean bathing waters (European Parliament and Council of the European Union, 2006)
Water Framework Directive 2000/60/EC (WFD)	The WFD sets out a commitment to protecting water bodies, including bodies of water designated as recreational waters (European Parliament and Council of the European Union, 2000).

2.3 CONSULTATION

2.3.1 Consultation is a key part of the Development Consent Order (DCO) application process. Consultation regarding issues related to Human Health has been conducted through the Evidence Plan Process Expert Technical Group meetings and the EIA scoping process, in line with the general process described within Volume 6, Part 1, Chapter 3: Environmental Impact Assessment Methodology.

2.3.2 An overview of VEs consultation process is presented within Volume 5, Report 1: Consultation Report.

2.3.3 A summary of the key issues raised during consultation to date, of relevance to Human Health, is outlined in Table 2.4 together with how these issues have been considered in the production of this ES.

2.3.4 As identified in Volume 6, Part 1, Chapter 4: Site Selection and Alternatives, the Project design envelope has been refined and will be refined further prior to DCO submission. This process is reliant on stakeholder consultation feedback.

2.3.5 Design amendments to cable routing and site selection are of relevance to this Chapter. These have been undertaken throughout the EIA process to inform the final design of the landfall area, onshore ECC and OnSS and is detailed in Volume 6, Part 1, Chapter 4: Site Selection and Alternatives. To minimise disruption to sensitive receptors (e.g., populated areas), the early adoption of primary (intrinsic design) commitments was made which define minimum separation distances from onshore infrastructure to residential properties (Volume 6, Part 3, Chapter 1: Onshore Project Description).

Table 2.4: Summary of Consultation Relating to Human Health

Consultation phase/type	Consultation and key issue raised	Section where comment addressed
Scoping Opinion (November 2021)	The ES should include a description and assessment (where relevant) of the likely significant effects resulting from accidents and disasters applicable to the Proposed Development.	Table 2.20 provides a summary of the major disasters considered across the ES, with references to where further information is provided. The overall conclusion is that after the relevant mitigation measures are applied, VE would not cause any significant residual effects in relation to major disasters. In addition, it should be noted that the iterative site selection process (as detailed within Volume 6, Part 1, Chapter 3: Site Selection and Alternatives) has ensured that VE has been located away from the most sensitive areas to major disasters.
Scoping Opinion (November 2021)	The Scoping Report states that no planned activities during the operation phase are anticipated which could result in the mobilisation of contaminants and hazardous substances. Based on this information the Inspectorate agrees that this matter can be scoped out of the assessment. However, the reasons for the absence of LSE must be fully justified in the ES.	Operational windfarms do not produce dust and traffic emissions, nor should they produce emissions to water or soil (including hazardous waste and substances) as confirmed in Volume 6, Part 3, Chapter 5: Ground Conditions and Land Use. An outline Code of Construction Practice and Outline Pollution Prevention and Emergency Incident Response Plan has been provided as part of the DCO application. In addition, a Hazard Identification (HazID) Report will be prepared and agreed with the relevant planning authority prior to construction of DCO Work It should also be noted that the handling and storage (or control) of large quantities of chemicals or substances hazardous to health has been scoped out as VE will not require large quantities of hazardous substances. Smaller quantities of hazardous substances such as paint and fuel will be stored in locked and/or bunded containment as appropriate. Section 2.4 which outlines the topic scope outlines that Impacts on health due to soil emissions which includes hazardous waste and substances has been scoped out of the assessment.
Scoping Opinion (November 2021)	The Scoping Report considers that due to the localised nature of any potential impacts, cumulative impacts are unlikely to occur unless there is overlap with the working areas and proposes that cumulative impacts will be considered following the creation of the shortlisting process and will seek to scope out cumulative impacts with the relevant consultees under the Evidence Plan process. The Inspectorate considers there is insufficient evidence to scope this matter out of the ES. Cumulative effects in terms of inter relationships with other developments, projects and activities should be considered, and where significant effects are likely to occur, these should be assessed within the ES. Accordingly, the ES should include an assessment of these matters or information demonstrating the absence of an LSE.	Section 2.14 considers cumulative effects.

Consultation phase/type	Consultation and key issue raised	Section where comment addressed
Scoping Opinion (November 2021)	For human health matters scoped into the ES, the assessment should include consideration of the potential for vulnerable groups to experience particular effects and identify any mitigation measures accordingly. The Applicant should make effort to agree the groups likely to be affected with relevant consultation bodies. The ES should explain how these vulnerable groups have been identified.	Section 2.5.7 of this Chapter considers vulnerable groups. In addition, the assessments in Sections 2.10 – 2.12 consider each impact on vulnerable groups.
Stakeholder Comment- Essex County Council (Regulation 42)	It is noted that within the documentation, reference is made to Health impacts over a large number of separate documents. It would be preferable if the same were incorporated within a separate Health Impact Assessment in the interest of clarity.	Noted. This Chapter has considered all health impacts throughout.
Stakeholder Comment - East of England Ambulance Service (EEAST)/East Sussex & North East Essex Foundation Trust (ESNEFT)/Suffolk and North East Essex – Integrated Care Board (Regulation 42)	Request made for a standalone HIA which ensures that the likely demand on healthcare services in relation to temporary workers is fully understood and appropriate plans are put in place to address any identified shortfalls.	The Applicant met with an NHS representative on 8th September and it was agreed that worker increase would be short term and minimal and could therefore be covered in the ES. Worker increase is considered to be minimal for the following reasons: > The Applicant has assessed employment at PEIR and updated it for ES; > Some employees will be local and will not contribute to additional demand to health care services; > Employees are expected to use their own; > GP's/healthcare or online services; > Any employees that are not local will use existing visitor accommodation (therefore no increase in new accommodation); and > Employees will follow strict Health and Safety and Code of Construction Practice (CoCP) (see Volume 9, Report 21). Due to there being no significant impact in terms of workers, no mitigation measures are proposed.
Stakeholder Comment Suffolk and North East Essex integrated Care Board (Regulation 42)	The ES should provide details on how the potential increase in demand on all healthcare services in the areas surrounding the proposed development, as an influx of additional temporary workers, will be mitigated against.	
East of England Ambulance Service (Regulation 42)	EEAST consider that the project is likely to have a significant impact on its operations, service capacity and resources (i.e. staff, vehicle fleet and estate assets) requiring appropriate mitigation and management measures to be identified at an early stage. This is mainly due to road closures.	VE has been amended to minimise road closures, with additional trenchless crossings committed to in the project design. Further details are provided in Volume 6, Part 3, Chapter 8: Traffic and Transport. **Table 2.15** within the conclusions provides a summary of the residual health effects. The ES has therefore assessed the scheme for significant impacts. There are now only five minor roads that may have temporary closures: > Demant's Farm Lane > Bentley Road

Consultation phase/type	Consultation and key issue raised	Section where comment addressed
		> Whitehall Lane > Payne's Lane > Barlon Road Road closures were sent to an NHS representative and there were no objections.
EEAST/ESNEFT/Suffolk and North East Essex (Regulation 42)	There is no assessment of major accident and disasters.	This has been covered in other chapters within the ES and is not a standalone chapter. An outline of potential major disasters and accidents that are discussed within the ES are presented within Table 2.20 of this Chapter, with the relevant ES chapters signposted. Vulnerability to major disasters that could affect VE are related to the aspects listed below, which predominantly stem from the projects marine operating conditions: > Risks to aviation; > Risks to shipping and navigation; > Flood risk; > Costal erosion at the landfall; and > And future climate change scenarios/projections that could increase vulnerability. This is approach has been adopted, as the above matters relating to major disasters and accidents have been covered across the ES and where required, mitigation has been proposed which has contributed to the conclusion that the effects are negligible. VE met with an NHS representative on 8th September and it was agreed that this approach was satisfactory
Tendring District Council (TDC) (Regulation 42)	TDC raise concerns about the health risks posed to residents within proximity to EMFs	EMFs are inevitable wherever electricity is produced, distributed, and used, including electrical substations, power lines and from household electrical equipment but the level of the magnetic field produced by alternating current underground power cables is less than the Earth's magnetic field in the UK. Moreover, EMFs from the electricity grid are low frequency and non-ionising. This term means that they do not have enough energy to cause damage to human or animal cells in the same way ionising radiation does. The World Health Organization states there is no evidence to conclude that exposure to low-level EMFs is harmful to human health.
		EMFs will be designed within regulatory standards, therefore there will be no likely significant population health effects. Information was set out in the PEIR chapter (and has been outlined in the ES chapter) to provide reassurance to those concerned surrounding EMF risk (i.e. a

Consultation phase/type	Consultation and key issue raised	Section where comment addressed
		person's understanding or views of the risk to their health, or outlook) and that exposure levels are well within health protection good practice standards. Additional mitigation measures to avoid adverse health outcomes from public's understanding of EMF risk are recommended, which include clear and non-technical information about electrical infrastructure and its compliance with UK guidance. This information demonstrates that any potential EMF risks have been assessed and do not pose a risk to public health.
		Despite the above, it should be noted that impacts on health due to exposure to EMFs (all phases) and exposure EMF (alone and cumulative) have been scoped out of the assessment (The Inspectorate, 2021).

2.4 SCOPE AND METHODOLOGY

SCOPE OF THE ASSESSMENT

2.4.1 The assessment scope has been informed by both national and local planning policy and guidance, established best practice and experience, as well as via the consultation process from relevant consultees.

IMPACTS SCOPED IN FOR ASSESSMENT

2.4.2 The following impacts have been scoped into this assessment:

- Construction
  - Impact 1: Noise and Vibration
  - Impact 2: Air Quality
  - Impact 3: Ground and/ or Water Contamination
  - Impact 4: Physical Activity
  - Impact 5: Journey Times and/or Reduced Access
- Construction and Operations Maintenance
  - Impact 6: Employment
- Operation and Maintenance
  - Impact 7: Noise
  - Impact 8: Wider Societal Benefits

2.4.3 Table 2.5 provides an overview of the impacts that have been scoped into the assessment.

Table 2.5: Determinants and Potential Effects Scoped into the Assessment

Health Determinants	Potential Health Effect	Relevant Technical ES Chapter
Noise and Vibration	Environmental noise is defined as unwanted or harmful outdoor noise created by human activities, including noise emitted by means of transport, road traffic, rail traffic, and from sites of industrial activity. Population exposure to environmental noise have been linked to adverse health effects. Annoyance and sleep disturbance are the key direct effects on the population. Evidence also suggests that high levels of noise nuisance and vibration cause by traffic and activities associated with construction works can result in indirect	Volume 6, Part 3, Chapter 9: Airborne Noise and Vibration

Health Determinants	Potential Health Effect	Relevant Technical ES Chapter
	effects such as increased aggression, and impaired communication (WHO, 1995). Onshore construction phase noise effects have the potential to affect health, as does operational noise from the onshore substation.	
Air Quality and Emissions	Temporary inhalation of particulates or exposure to exhaust emissions and dust.	Volume 6, Part 3, Chapter 10: Air Quality
Employment, access to work and local business	Potential for significant beneficial effects in relation to enabling residents of the area to access employment opportunities through construction activities and during operation.	Volume 6, Part 3, Chapter 3: Socioeconomics, Tourism and Recreation
Contaminated Land (and Water)	Contaminated land disturbed during construction could result in health effects through ingestion, inhalation or contact with liberated contamination. Pollution of surface or groundwater bodies which are subsequently used as a potable source could result in health effects.	Volume 6, Part 3, Chapter 5: Ground Conditions and Land Use. Volume 6, Part 3, Chapter 6: Hydrology, Hydrogeology and Flood Risk
Physical Promoting walking and cycling Safety Access to green space, open spaces, and physical activity Minimising car use	Effects of Public Rights of Way (PRoW) causing changes in accessing the footpath, cycleway and bridleway network. Effects from increased traffic on safety/accidents, severance/connectivity may arise due to connectivity. Loss of access to green space or diversions to access routes. Disruption of access to services and amenities.	Volume 6, Part 3, Chapter 3: Socioeconomics, Tourism and Recreation. Volume 6, Part 3, Chapter 5: Ground Conditions and Land Use. Volume 6, Part 3, Chapter 8: Traffic and Transport

Health Determinants	Potential Health Effect	Relevant Technical ES Chapter
Wider Societal benefits	Provision of affordable energy supplies supporting the UK in reducing in Greenhouse Gas (GHG) emissions.	Volume 6, Part 4, Chapter 1: Climate Change and Volume 6, Part 4, Annex 1.1: Greenhouse Gas Assessment

IMPACTS SCOPED OUT OF ASSESSMENT

2.4.4 In line with the Scoping Opinion (The Planning Inspectorate, 2021), and based on the receiving environment, expected parameters of VE (see Volume 6, Part 1, Chapter 3: EIA Methodology) and expected scale of impact/potential for a pathway for effect on the environment, and following the principles outlined in Section 2.4.16 (Assessment Methodology), several impacts have been scoped out of the assessment. This includes impacts on health due to exposure to EMFs across all phases. This matter has been scoped out of the assessment, as all electrical infrastructure associated with VE will have to comply with International Commission on Non-ionizing Radiation Protection (INIRP) guidelines for public exposure and design of electrical infrastructure, and the impact will be of negligible magnitude. In term of other impacts, below outlines all other matters that have been scoped out of the assessment:

- Impacts on health due to water emissions during operation;
- Impacts on health due to soil emissions (including hazardous waste and substances) during operation;
- Impacts on human health due to noise disturbance from operation of the onshore substation;
- Disruption to local road network (reduced access to services and amenities) during operation;
- Impacts on health due to exposure to EMFs (all phases);
- Impacts on health due to pests (all phases);
- Impacts on health due to odours (all phases); and
- Transboundary impacts.
- Disruption to local road networks including reduced access to services and amenities, during operation;
- Exposure to EMFs (alone and cumulative); and
- Impacts due to pests and odours.
- improvement of air quality relative to alternative fuel sources such as coal and gas power stations;
- Impacts on human health due to air, water and soil emissions as result of operations and maintenance phases; and
- Impacts on human health as a result from disruption to local road network as result of operations and maintenance phases.

TEMPORAL SCOPE

2.4.5 The temporal scope has been defined as follows:

- 'Very short term' relates to effects measured in hours, days, or weeks (e.g., effects, associated with cable laying activity past a particular dwelling);
- 'Short term' relates to effects measured in months (e.g., workforce use of accommodation);
- 'Medium term' relates to effects measured in years (e.g., local employment during construction);
- 'Long term' relates to effects measured in decades (e.g., the operational stage).

STUDY AREA

2.4.6 In terms of the spatial extent considered for potential health impacts (inclusive of physical and mental health), the following geographic classifications have been used within this Chapter who have the potential to be affected:

- Site-specific-LSOAs (the Project's Boundary);
- Local (Tendring);
- Regional (Essex); and
- National (England).

2.4.7 The 'site specific' level considers localised effects with reference to routine statistics collected for Lower Super Output Areas (LSOAs). LSOAs have been selected as these areas are representative of the populations who potentially may be affected health wise from the VE. This is in relation to the following design elements which are most likely to impact on health and will need to be considered as part of the assessment:

- Landfall – identification of exact landfall location, construction methods, working times, trenchless drilling locations;
- Onshore ECC – identified cable corridor, construction methods, working times, trenchless technique locations; and
- OnSS – site and footprint locations, change in plant specifications, change in height of any buildings, amendments on the materials utilised for the construction of any buildings.

2.4.8 The design elements that correspond to each LSOA is shown in Table 2.6.and the full boundaries are shown in Figures 2.1 – 2.3.

Table 2.6: Representative LSOAs for the different onshore design elements.

Design Element	Description	Representative LSOA	Justification
Landfall	The offshore ECC will make landfall at Sandy Point. The local environment in the vicinity of the landfall can be characterised as a rural/agricultural land environment, Frinton-on-Sea is situated to the northeast, and Holland-on-Sea is situated to the southwest, both are sizeable villages/towns with a dense residential build up.	Tendring 008G	The entirety of the landfall extent is located within Tendring 008G
Onshore export cable corridors	The entire length of the onshore ECC is approximately 24.5km in length, generally running in an east-west direction. The ECC runs from the landfall compound to the National Grids proposed East Anglia Connection Node (EACN) substation. Due to the length, it has been subdivided into 5 Route Sections.	Tendring 003E and Tendring 007B	Tendring 003E and Tendring 007B are located within the onshore cable corridor.
Onshore substation area	The OnSS will be sited north of the A120 to west of Little Bromley. The OnSS is adjacent to the proposed North Falls OWF project substation and the proposed National Grid's EACN substation area, both of which are currently underway with their consenting programme.	Tendring 005C	Tendring 005C only comprises a small portion of the OnSS search area, however, has been included as opposed to Tendring 005B. This is because the LSOA is more deprived and scores more poorly in terms of health baseline statistics and therefore fitting with the projects worst-case scenario approach. This is illustrated on Figure 2.1 which outlines deprivation levels within LSOAs.

2.4.9 It should be noted that these LSOAS have been selected to provide a profile of population potentially affected rather than the entirety of the area that may be affected. The selected LSOAs (Tendring 008G, Tendring 003E, Tendring 007B and Tendring 005C) characterise the population near the onshore design elements of VE (Landfall, ECC, OnSS), which is being assessed using a worst-case scenario. As such, this assessment assumes that the potential effects for other LSOAs, will be no greater than those assessed within this Chapter.

2.4.10 The study areas used in other chapters of this ES are of relevance, but do not necessarily define the boundaries of potential health effects. For example, effects on mental health and wellbeing are subjective and may not be limited to the area defined in relation to achieving certain regulatory thresholds. Consequently, this health chapter uses study areas to broadly define representative population groups rather than to set boundaries on the extent of potential effects.

2.4.11 Volume 6, Part 3, Chapter 9: Airborne Noise and Vibration and Volume 6, Part 3, Chapter 10: Air Quality were used to determine the local study area comprising a 500m buffer to factor in local services and receptors (such as doctors' surgeries and schools). The effects predicted in these chapters form the basis for assessment of health impact under the air quality and noise impact health determinant, explained in subsequent sections.

Figure 2.1: Tendring 008G Lower Super Output Area

Figure 2.2: Tendring 007B Lower Super Output Area

Figure 2.3: Tendring 003E Lower Super Output Area

Figure 2.4: Tendring 003E Lower Super Output Area

Figure 2.5: Deprivation levels of Lower Super Output Areas in Tendring

Data sources

BASLINE DATA COLLECTION

2.4.12 Baseline data relevant to health has been sourced from a range publicly accessible information and opensource data. The full list of data sources is presented within Annex 2.1 and 2.2, which include:

- Office for National Statistics Census 2021 (ONS, 2021);
- Department for Ministry of Housing, Communities & Local Government. English Indices of Deprivation 2019;
- The Index of Multiple Deprivation 2019 has been consulted and referenced as appropriate, including sub-domains and underlying indicators (Department of Communities and Local Government, 2019);
- Office for Health Improvement and Disparities (OHID) (2022a). Indicators: maps, data and charts. LOCAL HEALTH. [Online] Available at: https://www.localhealth.org.uk/#c=indicator&view=map12
- Office for Health Improvement and Disparities OHID (2022b). Fingertips: Public health data. Wider Determinants of Health. [Online] Available at: https://fingertips.phe.org.uk/profile/wider-determinants/data
- Office for Health Improvement and Disparities OHID (2022c). Public Health Outcomes Framework - Data. [Online] Available at: https://fingertips.phe.org.uk/profile/public-health-outcomes-framework

POPULATION GROUPS

2.4.13 The data has been collected based on 17 defined population groups that have the potential to be affected by VE in respect to health. These population groups are defined either as geographic, potentially hard to reach or other target groups that may face disproportionate health effects. A full break down of these groups is shown below:

GEOGRAPHIC POPULATION GROUPS

- Seven population groups have been selected based on the geographic study areas:
- The LSOA population near landfall (site-specific);
- Two LSOA population along the onshore ECC (site-specific);
- The LSOA near the OnSS options (site-specific);
- The population of Tendring (local);
- The population of Essex County (regional); and
- The population of England (national)

POTENTIALLY HARD TO REACH GROUPS

2.4.14 Hard to reach groups comprise sets of people who are more susceptible to the impact of VE than the wider population, these include:

- Children and young adults are more susceptible than others to air pollution, noise, and other environmental impacts. They are likely to have less experience and as a result lack judgement when moving around in traffic and other public spaces;

- The elderly and people with physical disabilities are more sensitive than young and middle-aged people. They are likely to have less able visual or other sensory perception and may have physical mobility problems. Changes to access routes may create anxiety or worry leading to withdrawal or isolation or reduced physical activity such as walking. They may or may not use public transport, depending on accessibility for family or other social visits, which could be affected as a result of VEs programme;
- People with physical and mental health problems, such as sleep disturbance, depression, and anxiety, may be more sensitive than others to the changes in their local environment;
- Cyclists, pedestrians, equestrians, and public transport users are likely to be affected by diversions to their travel routes or road and footpath closures, which may change their exposure to health risks, such as safety, air quality and noise; and
- People in low-income groups (income deprivation) are more likely to live in areas affected by environmental pollution (World Health Organisation, 2010) and face barriers to housing, which may cause stress and anxiety.

OTHER TARGET GROUPS

2.4.15 Other target groups that may face health impacts disproportionately are:

- Population within 100 m of the construction sites;
- Residents affected by construction-related traffic plying along their roads for a longer period throughout the day;
- Residents affected by other projects that will be built in the area around the same time;
- Employees (in offices or commercial spaces) working within 300m of the work site; and
- Tourists and visitors (likely to be impacted by construction, road closures, footpath diversion which may impact on stress).

ASSESSMENT METHODOLOGY

APPROACH

2.4.16 Consistent with the objective of EIA (as set out in EIA Directive 2014/52/EC), the methods identify effects that provide, or are contrary to providing, a high level of protection to human health. This includes reasoned conclusions in relation to health protection, health improvement and/or improving services.

2.4.17 The methods provide a framework to identify:

- The 'likelihood' of VE having an effect on health; and
- If an effect is likely, it may be 'significant' in the terms of the EIA regulations.

2.4.18 Effects are considered with regards the general population and hard to reach groups. Populations are considered at regional and local levels.

2.4.19 In line with best practice guidance from the WHO (WHO, 2012) and PHE (PHE, 2020), "health determinants" are considered to understand effects on human health and wellbeing. The methodology uses emerging best practice published by the Institute of Environmental Management and Assessment (IEMA) in line with the 'Health in Environmental Impact Assessment: Determining Significance for Human Health in Environmental Impact Assessment (IEMA, 2022), in addition to other best practice guidance by IEMA (Cave et al., 2017).

2.4.20 To identify whether there will be an effect on health, the chapter addresses the following key questions:

- Who is likely to be affected by the Project? VE might affect different population groups in different ways, for example the health consequences of a scheme may be different for existing residents, workers on site during construction, and hard to reach groups;
- What determinants of health may be affected? Health determinants are the factors that can influence health. For example, air quality, noise or access to green spaces and open spaces. The state of the health of individuals and communities is determined by many factors including their circumstances and environment. The assessment aims to forecast changes in health condition as a result of the potential changes to the health determinants due to the Project. The health determinants include community and economic factors as well as the physical environment. The list of determinants is drawn from existing literature and the local profile and is discussed are shown in Table 2.5.
- What is the current health status of the community (baseline information from desktop studies (Section 2.7 and Annex 2.1);
- What are the potential positive and negative impacts of VE against each of the categories identified in the determinants of health checklist? And if there are any negative effects, how can they be avoided, reduced, or compensated? Impacts often arise in indirect ways or could be unforeseen consequences and can happen at different stages of a causal pathway; and
- Identify whether any further evidence/research is needed to inform the final recommendations of the assessment.

2.4.21 The study has been conducted through the following steps:

- Policy reviews to provide the evidence base for identifying health determinants as well as to understand evidence available on the link between the health determinants and health effects;
- Determine the study area boundary and identify the health determinants;
- Profiling health characteristics of the population / determinants in the study area;
- Consult with the Project team to gather their views on health concerns relating to their discipline chapters of the ES; and
- Conduct the assessment and identify and incorporate mitigation measures, if any required, into the scheme design, construction activities and operational procedures.

2.4.22 The assessment has been conducted in line with the relevant sections of this NPS and in the technology specific NPSs to:

- Identify the impact on health of direct and indirect impacts;
- Identify and include information on any significant adverse health impact in the ES; and;

- Identify measures to avoid, reduce or compensate adverse health impacts, including cumulative impacts.

2.4.23 This Chapter has drawn upon the studies undertaken for the ES including modelling data and potential impacts on the population and the environment, for air quality and noise and vibration and other health determinants. This information has been used to map the causal pathways and impact prediction for this assessment.

HEALTH DETERMINANTS

2.4.24 The range of personal, social, economic, and environmental factors that influence health status are known as health determinants and include the physical environment, income levels, employment, education, social support, and housing. The 'wider determinants of health' model is used to conceptualise how human health spans environmental, social, and economic aspects. This is illustrated in Figure 2.6.

2.4.25 Influences that result in a change in determinants have the potential to cause beneficial or adverse effects on health, either directly or indirectly. The degree to which these determinants influence health varies, given the degree of personal choice, location, mobility, and exposure.

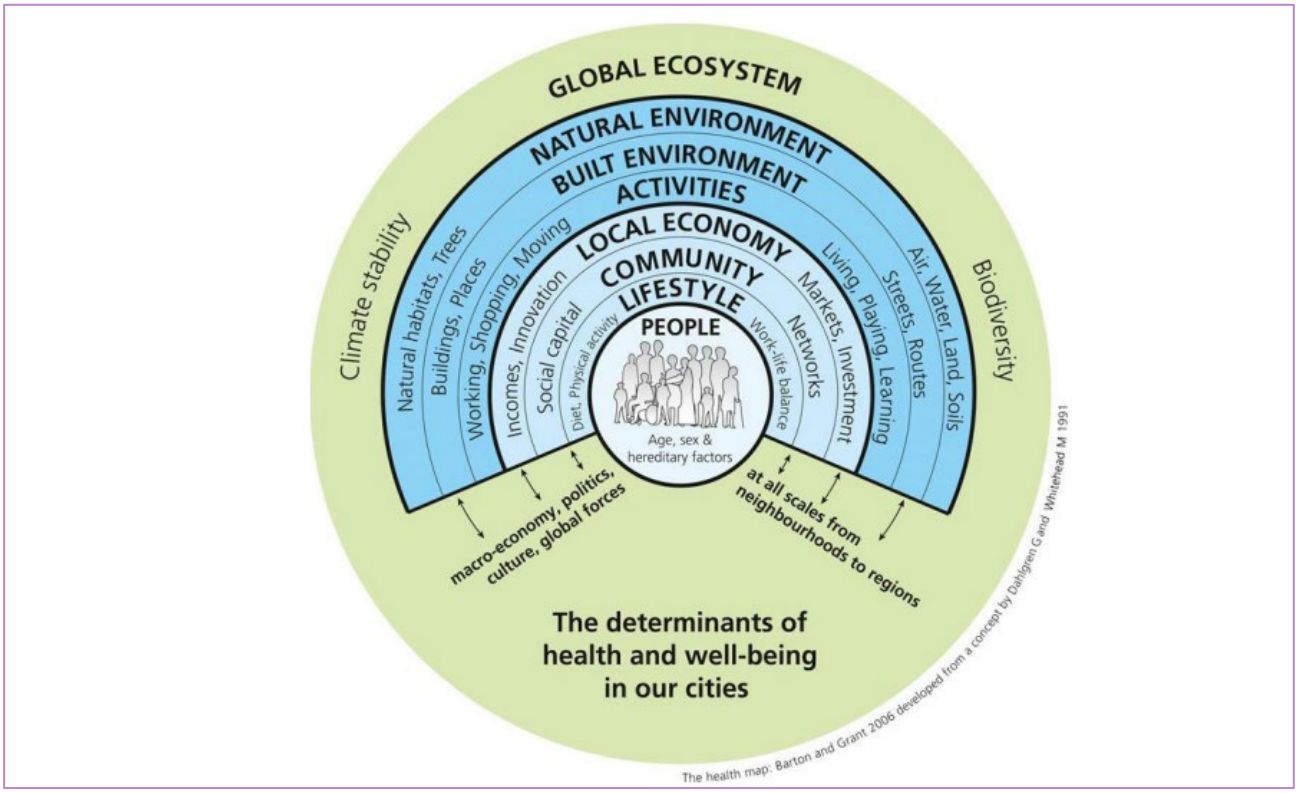

Figure 2.6: Wider Determinants of Health and Wellbeing[2]

2 Source: Based on the Dahlgren and Whitehead (1991) diagram as amended by Barton and Grant (2006) and advised by Cave et al. (2017)

2.5 ASSESSMENT CRITERIA AND ASSIGNMENT OF SIGNIFICANCE

OVERVIEW

2.5.1 Whilst Volume 6, Part 1, Chapter 3: EIA Methodology provides an indicative EIA assessment matrix, it also identifies that assessment methodologies will reflect the prevailing technical area guidance and specific requirements of receptor groups. As such the following sections provide a description of the assessment criteria and assessment methodologies used to assess health, which are derived from best practice guidance documents.

LIKELIHOOD

2.5.2 The first matter that needs to be considered to assess the significance of health determinants, is the likelihood of VE having an effect. A likely effect should be both plausible and probable:

- Plausible relates to their being a relevant source, pathway, and receptor (see discussion of health pathways below); and
- Probable relates to a qualitative judgement to exclude those effects that could only occur under certain very rare conditions, except where these relate to the Project's vulnerability to major accidents or disasters (as required by Part 1 paragraph 4(4) EIA Regulation 2017). The term ‘health pathways’ describe how a specific activity of VE could change a determinant of health and potentially result in a change in health outcomes (an effect).

2.5.3 Health pathways are considered with regards the source, pathway, and receptor as follows:

- A ‘source’ represents an activity or factor that could affect the health outcomes of a receptor population;
- A ‘pathway’ describes the method or route by which the ‘source’ could affect the ‘receptor’ (either causation or association); and
- A ‘receptor’ is the recipient of an effect from the ‘source’, via the ‘pathway’.

2.5.4 Table 2.7 shows how the Source-Pathway-Receptor model can be used to identify plausible health effects.

Table 2.7 Use of a Source-Pathway-Receptor model to identify plausible health effects

Source	Pathway	Receptor	Plausible Effect	Health	Rationale
X	√	√	No	X	There is not a clear source from where a potential health effect could originate.
√	X	√	No	√	The source of a potential health effect lacks a means of transmission to a population.
√	√	X	No	√	Receptors that would be sensitive or hard to reach to the health effect are not present.
√	√	√	Yes	√	Identifying a source, pathway and receptor does not mean an effect is a likely significant effect; the probability of the effect should be qualitatively considered, and a professional judgement reached on the significance of effects that are considered likely.

SIGNIFICANCE

2.5.5 A determination of significance is required for compliance with the EIA regulations 2017 when a potential effect of the Project is likely.

2.5.6 The determination of significance has two stages which are set out within IEMA (2022):

- Firstly, the sensitivity of the receptor affected, and the magnitude of the effect upon it are characterised. This establishes whether there is a relevant population and a relevant change in health outcomes to consider; and
- Secondly, a professional judgement is made as to whether or not the change in a population's health is significant. This judgement is based on the collection and presentation of data to evidence reasoned conclusions.

GENERAL POPULATION AND VULNERABLE GROUPS

2.5.7 In line with IEMA (2022) guidance, the assessment considers effects on how the 'general population' may differ from 'vulnerable group population' which is considered when determining the scoring sensitivity, with an overview provided below:

- In terms of life stage, the general population can be characterised as including a high proportion of people who are independent, as well as those who are providing some care. By contrast, the vulnerable group population can be characterised as including a high proportion of people who are providing a lot of care, as well as those who are dependant.
- The general population can be characterised as experiencing low deprivation. However, the professional judgment is that the vulnerable group population experiences high deprivation (including where this is due to pockets of higher deprivation within low deprivation areas).

- The general population can be characterised as broadly comprised of people with good health status. Vulnerable groups, however, tend to include those parts of the population reporting bad or very bad health status.
- The general population tends to include a large majority of people who characterise their day-to-day activities as not limited. The vulnerable group population tends to represent those who rate their day-to-day activities as limited a little or limited a lot.

2.5.8 Based on a professional judgement the general population's resilience (capacity to adapt to change) can be characterised as high, whilst the vulnerable group population can be characterised as having limited resilience.

2.5.9 Regarding the usage of affected infrastructure or facilities, the professional judgement is that the general population are more likely to have many alternatives to resources shared with the Project. For the vulnerable group population, the professional judgement is that they are more likely to have a reliance on shared resources.

SENSITIVITY

2.5.10 Table 2.8 sets out factors characterising sensitivity for human health as per IEMA (2022). The table informs the professional judgement on scoring high, medium, low, or negligible sensitivity. In line with best practice a formulaic matrix approach to determining sensitivity has been avoided. The 'higher' and 'lower' sensitivity characterisations represent instructive positions on a spectrum that would also include more extreme, as well as intermediate, positions. Most situations have a mix of higher and lower characterising factors, so a balanced expert view of sensitivity is taken.

Table 2.8: Factors Characterising Population Sensitivity (IEMA, 2022)

Category/Level	Indicative Criteria ((judgement based on most relevant criteria, it is likely in any given analysis that some criteria will span categories)
High	high levels of deprivation (including pockets of deprivation); reliance on resources shared (between the population and the project); existing wide inequalities between the most and least healthy; a community whose outlook is predominantly anxiety or concern; people who are prevented from undertaking daily activities; dependants; 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 inequalities between the most and least healthy; a community whose outlook is predominantly uncertainty with some concern; people who are highly limited from undertaking daily activities; people providing or requiring a lot of care; people with poor health status; and/or people with a limited capacity to adapt
Low	low levels of deprivation; many alternatives to shared resources; existing narrowing inequalities between the most and least healthy; a community whose outlook is predominantly ambivalence with some concern; people who are slightly limited from undertaking daily

Category/Level	Indicative Criteria ((judgement based on most relevant criteria, it is likely in any given analysis that some criteria will span categories)
	activities; people providing or requiring some care; people with fair health status; and/or people with a high capacity to adapt
Negligible	very low levels of deprivation; no shared resources; existing narrow inequalities between the most and least healthy; a community whose outlook is predominantly support with some concern; people who are not limited from undertaking daily activities; people who are independent (not a carer or dependant); people with good health status; and/or people with a very high capacity to adapt

2.5.11 The Assessment characterises the relevant populations for each health issue. For each category, the text sets out detail on the one or more relevant factors Table 2.9 that informed the score.

MAGNITUDE

2.5.12 Table 2.9 sets out factors characterising magnitude for human health, as per IEMA (2022). The table informs the professional judgement on assigning scoring of large, medium, small, or negligible magnitude. In line with best practice a formulaic matrix approach to determining magnitude has been avoided. The 'larger' and 'smaller' magnitude characterisations represent instructive positions on a spectrum that would also include more extreme, as well as intermediate, positions.

Table 2.9: Factors Characterising Magnitude (IEMA, 2022)

Category/Level	Indicative Criteria ((judgement based on most relevant criteria, it is likely in any given analysis that some criteria will span categories)
High	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

Category/Level	Indicative Criteria ((judgement based on most relevant criteria, it is likely in any given analysis that some criteria will span categories)
Low	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; 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.

2.5.13 The assessment characterises the relevant changes in health outcomes for each health issue. For each professional judgement on magnitude, the text sets out detail on the one or more relevant factors from Table 2.9 that informed the score.

JUDGEMENT FRAMEWORK FOR SIGNIFICANCE

2.5.14 Having established that a source, pathway, and receptor for impact exist, the magnitude/sensitivity methods are used to consider whether there is a relevant population to consider and a relevant change in health outcomes, a professional judgement is made as to whether or not the change in a population's health is significant.

2.5.15 The characterisation of sensitivity and magnitude provides consistency between EIA topics. However, other relevant information sources (in addition to sensitivity and magnitude) also need to be evidenced for the professional judgement on significance to be a reasoned and robust conclusion on population health outcomes.

2.5.16 The approach uses a framework for reporting on a range of data sources to ensure reasoned and robust professional judgements are reached. Key sources of data include scientific literature; baseline conditions; health priorities; consultation responses; regulatory standards; and policy context.

2.5.17 Guide questions set out in Table 2.10 are used to inform professional judgements on significance. The table informs the professional judgement on scoring major, moderate, minor, or negligible significance.

Table 2.10: Human Health Guide Questions for Determining Significance (IEMA, 2022)

Evidence sources	Guide Questions
Scientific literature	Is there a sufficient strength of evidence from sufficiently high-quality studies to support an association between the Project change, a relevant determinant of health and a relevant health outcome? Does the literature indicate thresholds or conditions for effects to occur? Are particular population groups identified as being particularly susceptible?
Baseline conditions	Are relevant sensitivities or inequalities identified in the scientific literature present? Does the baseline indicate that conditions differ from relevant local, regional, or national comparators? Are their geographic or population features of the baseline that indicate effects could be amplified?
Health priorities	Have local, regional, or national health priorities been set for the relevant determinant of health or health outcome (e.g., in Joint Strategic Needs Assessments or in Health and Wellbeing Strategies)?
Consultation responses	Has a theme of local, regional, or national consultation responses related to the relevant determinant of health or health outcome?
Regulatory standards (if relevant)	Is the change one that would be formally monitored by regulators? Are there regulatory or statutory limit values set for the relevant context? Has EIA modelling predicted change that exceed thresholds from the scientific literature or set by regulators? Are there relevant international advisory guideline limit values (e.g., by the WHO)?
Policy context	Does local, regional, or national government policy raise particular expectations for the relevant project change, determinant of health or health outcome (e.g., levels should be as low as reasonably practicable)? Is there a relevant international policy context (e.g., treaties or conventions)?

2.5.18 The table above informs the professional judgement on scoring major, moderate, minor, or negligible significance matrix, which is displayed in Table 2.11.

Table 2.11: Generic indicative EIA Significance matrix

		Sensitivity			
		High	Medium	Low	Negligible
Magnitude	High	Major	Major/moderate	Moderate/minor	Minor/negligible
	Medium	Major/moderate	Moderate	Minor	Minor/negligible
	Low	Moderate/minor	Minor	Minor	Negligible
	Negligible	Minor/negligible	Minor/negligible	Negligible	Negligible

2.5.19 As discussed, professional judgement is used to determine the level significance of effect. IEMA (2022) provides further guidance which is shown in Table 2.12 support decision making in deciding the level of significance.

Table 2.12: Significance conclusion and reasoning related to public health

Category/Level	Indicative Criteria ((judgement based on most relevant criteria, it is likely in any given analysis that some criteria will span categories)
Major (significant)	The narrative explains that this is significant for public health because (select as appropriate): > Changes, due to the project, have a substantial effect on the ability to deliver current health policy and/or the ability to narrow health inequalities, including as evidenced by referencing relevant policy and effect size (magnitude and sensitivity levels), and as informed by consultation themes among stakeholders, particularly public health stakeholders, that show consensus on the importance of the effect. > Change, due to the project, could result in a regulatory threshold or statutory standard being crossed (if applicable). > There is likely to be a substantial change in the health baseline of the population, including as evidenced by the effect size and scientific literature showing there is a causal relationship between changes that would result from the project and changes to health outcomes. > In addition, health priorities for the relevant study area are of specific relevance to the determinant of health or population group affected by the project

Category/Level	Indicative Criteria ((judgement based on most relevant criteria, it is likely in any given analysis that some criteria will span categories)
Moderate (significant)	The narrative explains that this is significant for public health because (select as appropriate): > Changes, due to the project, have an influential effect on the ability to deliver current health policy and/or the ability to narrow health inequalities, including as evidenced by referencing relevant policy and effect size, and as informed by consultation themes among stakeholders, which may show mixed views. > Change, due to the project, could result in a regulatory threshold or statutory standard being approached (if applicable). > There is likely to be a small change in the health baseline of the population, including as evidenced by the effect size and scientific literature showing there is a clear relationship between changes that would result from the project and changes to health outcomes. > In addition, health priorities for the relevant study area are of general relevance to the determinant of health or population group affected by the project
Minor (not significant)	The narrative explains that this is not significant for public health because (select as appropriate): > Changes, due to the project, have a marginal effect on the ability to deliver current health policy and/or the ability to narrow health inequalities, including as evidenced by effect size of limited policy influence and/or that no relevant consultation themes emerge among stakeholders. > Change, due to the project, would be well within a regulatory threshold or statutory standard (if applicable); but could result in a guideline being crossed (if applicable). > There is likely to be a slight change in the health baseline of the population, including as evidenced by the effect size and/or scientific literature showing there is only a suggestive relationship between changes that would result from the project and changes to health outcomes. > In addition, health priorities for the relevant study area are of low relevance to the determinant of health or population group affected by the project.

Category/Level	Indicative Criteria ((judgement based on most relevant criteria, it is likely in any given analysis that some criteria will span categories)
Negligible (not significant)	The narrative explains that this is not significant for public health because (select as appropriate): > Changes, due to the project, are not related to the ability to deliver current health policy and/or the ability to narrow health inequalities, including as evidenced by effect size or lack of relevant policy, and as informed by the project having no responses on this issue among stakeholders. > Change, due to the project, would not affect a regulatory threshold, statutory standard or guideline (if applicable). > There is likely to be a very limited change in the health baseline of the population, including as evidenced by the effect size and/or scientific literature showing there is an unsupported relationship between changes that would result from the project and changes to health outcomes. > In addition, health priorities for the relevant study area are not relevant to the determinant of health or population group affected by the project

2.5.20 The assessment section provides a structured discussion that responds to each of these questions and criteria set out in this section for each health issue. The discussion provides reasoned conclusions for the professional judgement as to whether in EIA terms an issue is significant, or not. Where appropriate, variation expressed in each evidence source has been reported. This approach is considered proportionate and in line with best practice for the consideration of human health.

2.5.21 Ultimately for human health, a likely significant effect is one that should be brought to the attention of the determining authority, as the effect of VE is judged to provide, or be contrary to providing, a high level of protection to human health. This may include reasoned conclusions in relation to health protection, health improvement and/or improving services.

2.5.22 For the purposes of this ES, major and moderate effects are deemed to be significant. In addition, whilst minor effects are not significant in their own right, it is important to distinguish these from other non-significant effects as they may contribute to significant cumulative effects.

2.5.23 Where significant adverse effects are identified, mitigation has been considered to reduce the significance of such effects. Similarly, enhancements have been considered where significant and proportionate opportunities to benefit population health have been identified. The residual effects represent the output of iterative assessment, taking into consideration the mitigation and enhancement measures.

2.5.24 This Chapter takes as its starting point the residual effects as assessed and determined in other relevant ES topic chapters. This includes taking into account relevant standard good practice mitigation.

POPULATION CONCLUSIONS

2.5.25 A population health approach has been used, as it would be disproportionate to reach conclusions on the potential health outcomes of individuals. To take account of potential inequalities, where appropriate, conclusions on a particular health issue have been reached for more than one population. For example:

- One conclusion for the general population (for a defined area); and
- A second separate sub-population conclusion for relevant vulnerable groups

2.6 UNCERTAINTY AND TECHNICAL DIFFICULTIES ENCOUNTERED

2.6.1 The assessment within this Chapter is based on available data obtained online. The most amount of data that was utilised within the assessment was sourced from Census Data, produced by the Office for National Statistics, which was produced in 2021. Since the publication of the data, there is likely to have been changes to trends analysed within this Chapter as a consequence of matters like population growth, changing economic landscapes and recovery from the pandemic etc.

2.6.2 Overall, a moderate to high level of certainty has been applied to the study. Where available, baseline data has been used to provide an overview of the health characteristics of the existing population. The information accessible in order to complete the assessment is considered sufficient to establish the relevant the health baselines for the selected population groups and therefore, there are no data limitations that would affect the conclusions of this assessment.

2.6.3 The Maximum Design Scenario (MDS) data identified in Table 2.14 have been selected as those having the potential to result in the greatest effect on an identified receptor or receptor group. These scenarios have been selected from the details provided in the project description (Volume 6, Part 3, Chapter 1: Onshore Project Description and Volume 6, Part 2, Chapter 1: Offshore Project Description). Effects of greater significance are not predicted to arise should any other development scenario to that assessed here be taken forward in the final design scheme, within the assessed boundaries.

2.7 EXISTING ENVIRONMENT

OVERVIEW

2.7.1 An outline of the existing and baseline environment is provided within Volume 6, Part 4, Chapter 2, Annex 2.1: Human Health Baseline.

2.7.2 This annex provides information on the current conditions in relation to health and wellbeing for people who live within the local area, including age, health issues, income, employment and qualifications. It also provides information on the community infrastructure that supports the existing population in terms of education, health care provision and access to recreation facilities and open space. It is necessary to understand the baseline conditions in order to assess how VE would impact on health and wellbeing of the existing community.

LIMITATIONS

2.7.3 The baseline data on demography and health patterns of the local residents have largely been based on secondary sources and information collected from initial consultation with key stakeholders. While this search has provided information on hard to reach groups along the proposed route, it is possible that not all specific cases have been captured.

GENERAL STATISICS

2.7.4 The Essex Joint Health and Wellbeing Strategy 2018 – 2022 (JHWB) identifies the following areas of focus:

- Improving mental health and wellbeing;
- Addressing obesity, improving diet, and increasing physical activity;
- Influencing conditions and behaviours linked to health inequalities; and
- Enabling and supporting people with long term conditions and disabilities.

2.7.5 Further to this, four priority measures are also highlighted, these are:

- Reduction in suicide rates in line with Essex Mental Health strategy and reduce admission rate for acute mental health issues;
- Reduction in the percentage of residents (aged 16+) who undertake less than 30 minutes physical activity per week (Sports England Survey);
- Halt the increasing difference in life expectancy at birth between affluent and deprived communities in males and females across Essex; and
- A reduction in the gap in employment rate for adults with mental health issues and disabilities who are economically active.
- Other notable statistics within the JHWB include:
- Loneliness is an increasing challenge within Essex, with around a third of the population feel they lack companionship (34%) and feel isolated from others (33%) some of the time or often;
- 4 areas in Essex are within the top 20 suicide rate areas in England;
- Within Essex, 63.8% of the adult population being overweight or obese, 22.3% of children aged 4-5 years old being overweight or obese and 33.1% of our 10–11-year-olds being overweight or obese. It is also noted that Tendring that has the highest levels of excess weight in their 4–5-year-olds (30%);
- Essex has an ageing population within the number of 28% in the next decade whilst the number of over 85s is set to grow even further by 55%;

BASELINE COMPARISONS

- Table 2.13 below provides some of the key census-related statistics captured within Annex 2.1 and 2.2.

Table 2.13: Health Baseline Comparisons Local to National

Population Group Variable	Site Specific								Local		Regional		National	
	Tendring 008G		Tendring 003E		Tendring 007B		Tendring 005C		Tendring		Essex		England	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Age Structure and Total Population														
Age 0-15-children and young people (ONS, 2020; for site specific population groups)	302	15.4	212	12.8	192	15.2	211	14.4	23401	15.8	279347	18.5	10483094	19
Age 16-64- working aged people (ONS, 2020; for site specific population groups)	1029	52.8	956	57.7	60.8	766	904	62.0	81,017	54.8	914195	60.9	35605651	62.9
Age 65 and over- older people (ONS, 2020; for site specific population groups)	615	31.6	463	27.9	23.9	301	344	23.6	43869	29.5	309978	20.7	10401300	23
Total Population (ONS, 2020; for site specific population groups)	1,946	100	1,656	100	1,250	100	1,459	100	148,287	100	1,503,520	100	56,490,045	100
Gender														
Male	933	48.3	815	47.9	657	49.0	780	50.6	71,475	48.2	732,332	48.7	27,656,336	49.0
Female	997	51.7	886	52.1	685	51.0	761	49.4	76,817	51.8	771,189	51.3	28,833,712	51.0
Population density (per square kilometre)														
population density	184.1	N/A	62.7	N/A	50.3	N/A	60.2	N/A	440.9	N/A	434.7	N/A	0.4	N/A

Population Group Variable	Site Specific								Local		Regional		National	
	Tendring 008G		Tendring 003E		Tendring 007B		Tendring 005C		Tendring		Essex		England	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
General Health														
Very good health	812	42	813	47.8	648	48.3	718	46.6	58,492	39.4	730257	48.6	27,390,829	48.5
Good health	666	34.5	533	32.5	440	32.8	523	33.9	52,819	35.6	515,958	34.3	19,040,735	33.7
Fair health	311	16.1	220	12.9	174	12.0	205	13.3	25,460	17.2	187,032	12.4	7,147,346	12.7
Bad health	115	5.9	70	4.1	61	4.5	75	4.9	8,891	6.0	54,440	3.6	2,248,255	4.0
Very bad health	29	1.5	44	2.6	20	1.5	20	1.3	2,630	1.8	15,834	1.1	662,881	1.2
Provision of unpaid care														
Provides 19 hours or less unpaid care a week	78	4.2	79	4.8	63	5.0	82	5.5	6,587	4.7	63,593	4.5	2,303,725	4.3
Provides 20 to 49 hours unpaid care a week	46	2.5	25	1.5	36	2.8	31	2.1	3,275	2.3	23,431	1.6	969,769	1.8
Provides 50 or more hours unpaid care a week	79	4.3	52	3.2	41	3.2	50	3.4	5,847	4.1	37,418	2.6	1,404,771	2.6
Households by deprivation dimensions														
Households is not deprived in any dimension	311	39.9	345	53.7	265	47.9	312	51.3	25,858	38.3	307,011	49.0	11,349,737	48.4
Households is deprived in one dimension	299	38.3	216	33.6	189	34.2	211	34.7	25,422	37.7	213,515	34.1	7,842,691	33.5

Population Group Variable	Site Specific								Local		Regional		National	
	Tendring 008G		Tendring 003E		Tendring 007B		Tendring 005C		Tendring		Essex		England	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Households is deprived in two dimensions	140	17.9	66	10.3	73	13.2	74	12.2	12,755	18.9	85,342	13.6	3,320,584	14.2
Households is deprived in three dimensions	27	3.5	14	2.2	24	4.3	11	1.8	3,171	4.7	19,278	3.1	868,104	3.7
Households is deprived four dimensions	3	0.4	1	0.2	2	0.4	0	0.0	244	0.4	1,326	0.2	54,970	0.2
Economic activity status														
Economically active (excluding full-time students)	772	47.7	809	55.1	631	57.1	759	57.4	60,619	48.5	728,490	59.5	26,945,252	58.6
Economically active (excluding full-time students): In employment	731	45.2	789	53.7	603	54.6	741	56.1	57,207	45.8	697,698	57.0	25,632,523	55.7
Economically active (excluding full-time students): Unemployed	41	2.5	20	1.4	28	2.5	18	1.4	3,412	2.7	30,792	2.5	1,312,729	2.9
Economically inactive: Retired	586	36.2	400	27.2	256	23.2	332	25.1	42,714	34.2	295,589	24.1	9,882,054	21.5
Economically inactive: Looking after home or family	86	5.3	63	4.3	53	4.8	71	5.4	6,140	4.9	57,788	4.7	2,207,738	4.8

Population Group Variable	Site Specific								Local		Regional		National	
	Tendring 008G		Tendring 003E		Tendring 007B		Tendring 005C		Tendring		Essex		England	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Economically inactive: Long-term sick or disabled	65	4.0	97	6.6	70	6.3	85	6.4	6,725	5.4	40,045	3.3	1,874,300	4.1
Employment History														
Not in employment: Worked in the last 12 months	83	9.5	61	9.1	65	13.2	59	10.5	5,895	8.9	61,526	12.1	2,592,965	13.2
Not in employment: Not worked in the last 12 months	645	73.7	466	69.6	320	64.9	400	71.3	47,167	70.8	343,512	67.3	11,983,992	61.1
Not in employment: Never worked	147	16.8	143	21.3	108	21.9	102	18.2	13,548	20.3	105,346	20.6	5,024,786	25.6
Hours Worked														
Full-time	475	63.8	551	68.9	415	67.7	502	66.1	38,123	65.4	499,101	69.9	18,533,776	70.2
Part-time	269	36.2	249	31.1	198	32.3	258	33.9	20,158	34.6	214,694	30.1	7,871,438	29.8
Gross Weekly (mean) Pay (£)														
Total (ONS, 2022)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	561.9	N/A	664.8	N/A	629.9	N/A
Full Time Workers (ONS, 2022)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	712.6	N/A	819.9	N/A	766.0	N/A
Part Time Workers (ONS, 2022)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	225.8	N/A	257.6	N/A	267.6	N/A

Population Group Variable	Site Specific								Local		Regional		National	
	Tendring 008G		Tendring 003E		Tendring 007B		Tendring 005C		Tendring		Essex		England	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Occupation														
Managers, directors and senior officials	114	15.3	158	19.8	106	17.3	144	18.9	7,191	12.3	103,799	14.5	3,403,916	12.9
Professional occupations	98	13.2	150	18.8	89	14.5	101	13.3	7,457	12.8	131,247	18.4	5,356,649	20.3
Associate professional and technical occupations	79	10.6	111	13.9	77	12.5	95	12.5	6,596	11.3	97,818	13.7	3,499,749	13.3
Administrative and secretarial occupations	74	10.0	88	11.0	68	11.1	83	10.9	5,591	9.6	78,902	11.1	2,446,565	9.3
Skilled trades occupations	120	16.2	94	11.8	96	15.6	113	14.8	8,071	13.8	80,129	11.2	2,683,139	10.2
Caring, leisure and other service occupations	90	12.1	69	8.6	62	10.1	61	8.0	7,829	13.4	64,535	9.0	2,447,148	9.3
Sales and customer service occupations	66	8.9	46	5.8	44	7.2	50	6.6	5,007	8.6	49,363	6.9	1,972,553	7.5
Process, plant and machine operatives	40	5.4	35	4.4	27	4.4	56	7.3	4,518	7.8	44,902	6.3	1,832,666	6.9
Elementary occupations	62	8.3	49	6.1	45	7.3	59	7.7	6,020	10.3	63,099	8.8	2,762,829	10.5

Population Group Variable	Site Specific								Local		Regional		National	
	Tendring 008G		Tendring 003E		Tendring 007B		Tendring 005C		Tendring		Essex		England	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Distance Travelled to Work														
Less than 2km	28	3.8	26	3.2	29	4.7	22	2.9	29	4.7	69,745	9.8	2,898,994	11.0
2km to less than 5km	118	15.8	34	4.2	34	5.5	47	6.2	34	5.5	68,261	9.6	3,335,948	12.6
5km to less than 10km	78	10.5	72	9.0	103	16.8	145	19.1	103	16.8	61,630	8/6	3,099,302	11.7
10km to less than 20km	45	6.0	167	20.8	84	13.7	89	11.7	84	13.7	74,331	10.4	2,750,302	10.4
20km to less than 30km	72	9.7	13	1.6	17	2.8	23	3.0	17	2.8	38,537	5.4	1,051,967	4.0
30km to less than 40km	13	1.7	10	1.2	7	1.1	13	1.7	7	1.1	19,786	2.8	439,294	1.7
40km to less than 60km	15	2.0	12	1.5	12	2.0	8	1.1	12	2.0	17,872	2.5	336,581	1.3
60km and over	24	3.2	25	3.1	18	2.9	18	2.4	18	2.9	10,618	1.5	355,062	1.3
Works mainly from home	188	25.2	322	40.1	199	32.4	245	32.3	199	32.4	230,883	32.3	8,321,252	31.5
Method of transport to workplace														
Work mainly at or from home	188	25.2	322	40.3	199	32.5	245	32.3	13,322	22.9	230,883	32.3	8,321,252	31.5
Underground, metro, light rail, tram	1	0.1	0	0.0	2	0.3	0	0.0	77	0.1	7,696	1.1	504,716	1.9
Train	23	3.1	10	1.3	10	1.6	7	0.9	1,090	1.9	23,067	3.2	517,902	2.0
Bus, minibus or coach	8	1.1	2	0.3	4	0.7	7	0.9	642	1.1	12,319	1.7	1,129,539	4.3
Taxi	0	0.0	1	0.1	4	0.7	3	0.4	288	0.5	3,572	0.5	192,884	0.7

Population Group Variable	Site Specific								Local		Regional		National	
	Tendring 008G		Tendring 003E		Tendring 007B		Tendring 005C		Tendring		Essex		England	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Motorcycle, scooter or moped	4	0.5	5	0.6	4	0.7	4	0.5	309	0.5	3,081	0.4	124,207	0.5
Driving a car or van	454	60.9	400	50.1	337	55.0	437	57.6	33,570	57.6	344,352	48.2	11,751,945	44.5
Passenger in a car or van	29	3.9	18	2.3	15	2.4	21	2.8	2,432	4.2	24,913	3.5	1,017,402	3.9
Bicycle	14	1.9	6	0.8	8	1.3	4	0.5	1,018	1.7	9,741	1.4	554,215	2.1
On foot	19	2.5	30	3.8	26	4.2	26	3.4	4,895	8.4	46,977	6.6	2,016,981	7.6
Other method of travel to work	6	0.8	5	0.6	4	0.7	5	0.7	638	1.1	7,192	1.0	274,171	1.0
Car or van availability														
No cars or vans in household	93	11.9	49	7.6	54	9.7	47	7.8	13,583	20.1	99,454	15.9	5,516,098	23.5
1 car or van in household	317	40.6	197	30.7	210	37.9	167	27.6	29,208	43.3	255,505	40.8	9,674,645	41.3
2 cars or vans in household	241	30.9	229	35.7	185	33.4	222	36.6	17,384	25.8	191,930	30.6	6,106,970	26.1
3 or more cars or vans in household	129	16.5	167	26.0	105	19.0	170	28.1	7,278	10.8	79,584	12.7	2,138,372	9.1
Highest level of qualification														
No qualifications	401	24.8	291	19.8	192	17.4	239	18.1	32,782	26.2	230,974	18.9	8,317,789	18.1

Population Group Variable	Site Specific								Local		Regional		National	
	Tendring 008G		Tendring 003E		Tendring 007B		Tendring 005C		Tendring		Essex		England	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Level 1 and entry level qualifications	185	11.4	138	9.4	116	10.5	160	12.1	16,158	12.9	142,834	11.7	4,456,198	9.7
Level 2 qualifications	259	16.0	216	14.7	189	17.1	222	16.8	19,076	15.3	193,117	15.8	6,126,130	13.3
Apprenticeship	115	7.1	72	4.9	78	7.1	96	7.3	8,535	6.8	69,118	5.6	2,446,935	5.3
Level 3 qualifications	255	15.7	250	17.0	216	19.6	242	18.3	19,444	15.6	212,917	17.4	7,784,977	16.9
Level 4 qualifications or above	361	22.3	453	30.8	291	26.4	321	24.3	24,811	19.9	341,104	27.9	15,606,458	33.9
Other qualifications	44	2.7	51	3.5	22	2.0	40	3.0	4,084	3.3	34,111	2.8	1,268,468	2.8
Disability (disabled under the disability Act)														
Disabled under the Equality Act	449	23.3	386	22.7	267	19.9	309	20.1	35,694	24.1	250,552	16.7	9,774,510	17.3
Day-to-day activities limited a lot	206	10.7	211	12.4	113	8.4	143	9.3	16,483	11.1	102,130	6.8	4,140,357	7.3
Day-to-day activities limited a little	243	12.6	175	10.3	154	11.5	166	10.8	19,211	13.0	148,422	9.9	5,634,153	10.0
Disability (not disabled under the disability Act)														
Not disabled under the Equality Act	1,481	76.7	1,315	77.3	1,075	80.1	1,232	79.9	112,598	75.9	1,252,969	83.3	46,715,538	82.7
Not disabled under the Equality Act: Has long term physical or mental health condition but	133	6.9	114	6.7	96	7.2	128	8.3	10,540	7.1	107,180	7.1	3,856,029	6.8

Population Group Variable	Site Specific								Local		Regional		National	
	Tendring 008G		Tendring 003E		Tendring 007B		Tendring 005C		Tendring		Essex		England	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
day-to-day activities are not limited														
Not disabled under the Equality Act: No long term physical or mental health conditions	1,348	69.8	1,201	70.6	979	73.0	1,104	71.6	102,058	68.8	1,145,789	76.2	42,859,509	75.9

EVOLUTION OF THE BASELINE

2.7.6 The baseline will evolve over time due to existing ongoing influences such as health interventions leading to demographic change. It is important to note that these changes will take place with or without the proposed VE development, and that any influence from VE may have on the future baseline would be minor, particularly over the longer term.

2.8 KEY PARAMETERS FOR ASSESSMENT

2.8.1 The MDS identified in the table below have been selected as those to having the potential to result in the greatest effect on the identified population groups. The realistic MDS is provided within Volume 6, Part 2, Chapter 1: Offshore Project Description and Volume 6, Part 3, Chapter 1: Onshore Project Description. The following sections summarise the key elements of VE that may affect human health. Assumptions considered for maximum design scenarios are outlined in Table 2.14.

2.8.2 Details of human health impacts associated with the following technical topics are detailed within the MDS tables within the relevant chapters:

- Volume 6, Part 3, Chapter 3: Socio-Economic, Tourism and Recreation;
- Volume 6, Part 3, Chapter 5: Ground Conditions and Land Use;
- Volume 6, Part 3, Chapter 6: Hydrology, Hydrogeology and Flood Risk;
- Volume 6, Part 3, Chapter 8: Traffic and Transport;
- Volume 6, Part 3, Chapter 9: Airborne Noise and Vibration;
- Volume 6, Part 3, Chapter 10: Air Quality;

Table 2.14: Maximum design scenario

Element	Worst Case Criteria	Worst Case Definition
Landfall HDD		
Construction	Construction period	VE would be expected to take 5 years to complete.
	Working hours	Core working hours are 07:00-19:00 Monday to Saturday.
	Expected noise level	See Volume 6, Part 3, Chapter 9: Airborne Noise and Vibration
	Maximum HDD depth below the surface (m)	20
	Number of cable circuits	24
	Indicative Subtidal HDD length (m)	1,100
	Indicative Intertidal HDD length	

Element	Worst Case Criteria	Worst Case Definition
Onshore ECC		
Construction	Length	Up to 24.5km
	Construction period	18–24-month period
	Peak onshore construction	See Volume 6, Part 3, Chapter 3: Socioeconomics, Tourism and Recreation
	Expected Noise Level	See Volume 6, Part 3, Chapter 9: Airborne Noise and Vibration
	Working Width	90m
OnSS		
Construction	Maximum area of temporary construction compound	37,500 m²
	Construction period	24-month period
	Expected Noise Level	See Volume 6, Part 3, Chapter 9: Airborne Noise and Vibration
Operation	Maximum number of onshore substations	1
	Maximum area of AIS substation	58,000 m2
	Maximum area of GIS substation	45,000 m2
	Access	Planned maintenance associated with the onshore ECC would involve approximately one visit to each cable joint pit per year by two maintenance personnel.
	Expected Noise Level	See Volume 6, Part 3, Chapter 9: Airborne Noise and Vibration

2.9 MITIGATION

2.9.1 Mitigation measures that have been identified are listed in Table 2.15. The assessment takes account of any design controls and environmental principles that are incorporated into the design of VE and any Control Documents / Management Plans that are intended to be secured by the Development Consent Order.

2.9.2 These include:

- Volume 9, Report 24: Outline Construction Traffic Management Plan in terms of managing the transport and environmental effects on community receptors related to construction traffic;
- Volume 9, Report 21: Code of Construction Practice (CoCP) in terms of managing construction activity including reducing potential effects on community and recreational receptors in terms of air quality, construction noise and vibration, dust and lighting; and
- Volume 9, Report 25: Outline Public Access Management Plan (PAMP) – in terms of management of effects on recreational routes and PRoW for access.

2.9.3 In addition, it should be noted that the iterative site selection process (as detailed within Volume 6, Part 1, Chapter Site Selection and Alternatives) has ensured that VE has been located away from the most sensitive areas to health receptors where possible.

Table 2.15: Mitigation Relating to Human Health

Project Phase	Mitigation Measures in the project design
Construction	
Best practice construction measures	Construction works will be undertaken in accordance with the Code of Construction Practice (see Volume 9, Report 21: Code of Construction Practice)
Trenchless Techniques	VE has committed to using trenchless technologies which will minimise road closures as a result of the project.
Project Design	Careful routing of the onshore cable route and positioning of the landfall. OnSS and TCCs to avoid key areas of sensitivity.
Construction Traffic Management Plan (CTMP)	Outline CTMP sets out the key principles and types of measures to be implemented during construction of VE
Decommissioning	
Best practice construction measures	Decommissioning works would be undertaken in accordance with best practice measures at the relevant time.

2.10 ENVIRONMENTAL ASSESSMENT: CONSTRUCTION PHASE

2.10.1 This section outlines the impacts that potentially may arise from the construction phase. The sensitivity of vulnerable groups and the wider populations is detailed throughout this section.

2.10.2 Details regarding the temporal scope is provided within Paragraph 2.4.5 , with the sensitivity, magnitude and significance of determined in accordance with the methodology presented within Section 0 of this Chapter.

IMPACT 1: NOISE

2.10.3 During construction, there is potential for temporary noise to be generated during construction works and movement of heavy goods vehicles across the onshore VE study area (see Table 2.5).

2.10.4 The population groups relevant to this assessment, due to either proximity or other sensitivity, are defined in Paragraphs 2.4.13-2.4.15.

2.10.5 The key health outcomes relevant to noise as a determinant of health are cardiovascular health (only as a result of chronic noise effects), mental health (including stress, anxiety, or depression) and cognitive performance in children, particularly at school. This is particularly relevant within health priorities set out by the JHWB by Essex County Council (Paragraphs 2.7.4-2.7.5).

2.10.6 The temporal scope for this effect (as described in Paragraph 2.4.5) varies depending on the area of the Project.

2.10.7 During the construction of VE, noise from construction activities will inevitably be generated and will, during certain phases of construction, be audible at residential receptors in the vicinity of construction activities.

2.10.8 Details of the construction works are described in Volume 6 Part 3, Chapter 1: Onshore Project Description. A detailed list of indicative construction plant, operational noise levels and associated on-times for all the construction activities/operations have been provided; the full list of plant and construction impacts are included within Volume 6, Part 6, Annex 9.2: Onshore Airborne Noise Construction Sound Power Details.

2.10.9 The conclusions of Volume 6, Part 3, Chapter 9: Airborne Noise and Vibration can be characterised as follows:

- No significant adverse residual effects at the landfall after additional mitigation;
- No significant adverse residual effects at the ECC after additional mitigation;
- No significant adverse residual effects at the OnSS after additional mitigation;
- No significant adverse residual effects in terms of construction vehicle noise; and
- No significant adverse residual effects in relation to construction vehicular noise after additional mitigation.

2.10.10 The mitigation measures taken into consideration during the assessment are described in Volume 6, Part 3, Chapter 9: Airborne Noise and Vibration. Details regarding mitigation for construction traffic are also outlined within Volume 9, Report 21: Code of Construction Practice.

SOURCE-PATHWAY-RECEPTOR

2.10.11 The potential effect is considered likely because (based on the methods described in Section 0) there is a plausible source-pathway-receptor relationship where:

- The source is construction plant and operations;
- The pathway is pressure waves through the air; and
- Receptors are communities of people within residential properties.

2.10.12 Furthermore, the potential effect is probable as no unusual conditions are required for the source-pathway-receptor linkage.

SENSITIVITY OF RECEPTOR

2.10.13 The sensitivity of both the general population and vulnerable groups is determined separately in accordance with the methods presented in Section 2.5. The sensitivity of is considered to be low for the general population and high for vulnerable groups.

2.10.14 Overall, the local population considered in relation to noise sensitivity is considered medium. Vulnerability in this case is particularly linked to:

- Living close to sources of noise;
- Age (both young people and older people);
- Existing poor health (e.g., Long-term illness);
- Spending more time in affected dwellings (e.g., Due to low economic activity, shift work; or ill health); or
- Vulnerability due to deprivation or health inequalities.

2.10.15 Based on the data presented in Volume 6, Part 4, Chapter 2, Annex 2.1: Human Health Baseline, in Tendring, the health of the population is varied. However, on average, the life expectancy for males in 78.2 and for females this is 82.0. This is lower than the average for Essex (80.2 and 83.8 respectively) and England (79.4 and 83.1 respectively). This alludes to a slightly poorer quality of health in Tendring when compared to the regional and national average. This proclamation is also in-line with data regarding the self-assessment of health; 75% of people within Tendring believe that they have very good health or good health, which is lower when compared to the regional (82.9%) and national average (82%). However, all LSOAs (lowest being Tendring 008G at 75.4%) are higher than the local average.

2.10.16 In addition, the indices of multiple deprivation data presented in Volume 6, Part 4, Chapter 2, Annex 2.1 and Volume 6, Part 4, Chapter 2, Annex 2.2 provide evidence that residents have a poor quality of health; Tendring is ranked in the top 30 most deprived authorities (out of 317) and all the LSOAs are within the top 40% most deprived areas, with Tendring 003E and Tendring 007B in the top 20%.

2.10.17 The baseline data also indicates the areas near the onshore infrastructure represent an ageing population (aged 65+) when compared to the regional (20.7%) and national average (23%). The highest proportion of residents aged 65 are near the Landfall (Tendring 008G) with this group accounting for 31.6% of the population, which is higher than the local (29.5%), regional (20.7%) and national (23%) percentage. This infers that the populations near the VE infrastructure are likely to spend longer periods of time at home in comparison to those aged 16-64 (chracterised as working aged people) and therefore are absent during the working day. As such, these populations will be most exposed from noise generated from the project.

2.10.18 The baseline data further suggests the LSOA populations are likely to spend extended periods of time at home due to retirement or long-time illness. This is most prevalent at the area near the landfall (Tendring 008G); 36.2% of the population are retired which is higher than the local (34.2%), regional (24.1%) and national (21.5%) average. In relation people with long-term illnesses, all the LSOAs, with the exception of Tendring 008G, contain a higher percentage when compared to the local, regional and national average. The highest percentage is near the ECC (at Tendring 003E), with 6.6% of the population having a long-term illness.

2.10.19 However, compared to the regional and national average, Tendring and the four LSOAs assessed have a younger percentage of the population who are children (aged 0-15), which is a group who are considered to spend long periods at home. Tendring as a whole has the highest percentage (15.8%) out of the five populations, which is lower than Essex (18.5%) and England (19%).

2.10.20 In summary, the baseline indicates the sub-population considered are more likely to spend extended periods at home due to be characterised as having an older demographic, retirement, or long-term illnesses and as a consequence be greater exposed to noise generated from the project. The baseline also indicates that the population at Tendring and the four LSOAs have worse health compared to Essex and England. Two of the LSOAs are also amongst the 20% most deprived areas in England.

2.10.21 Below is the reasoning for the for-sensitivity level decided for the general population and vulnerable groups:

- The general population is considered to have a low sensitivity, as impacts relating to noise will be predominantly experienced by groups who live near the VE infrastructure. Moreover, these impacts will occur over a short period of time and are reversible.
- The sensitivity of vulnerable groups is considered to be high; the baseline data infers the populations at the site-specific levels are likely to spend greater periods at home and as a consequence be greater exposed to projected generated noise. This is coupled with the fact that these populations have lower levels of health and higher scores of deprivation when compared to the regional and national averages

MAGNITUDE OF IMPACT

2.10.22 The magnitude of the change due to VE can be characterised as a low magnitude of change (based on the methods described in Section 2.5). Construction related noise close to particular dwellings or other community receptors would be infrequent and of short duration (being predominantly limited to periods of passing trench work or vehicle traffic). The levels of noise experienced would be within working noise limits for temporary disruption. At these levels it is unlikely that there would be changes in the risk of developing a new health condition or of exacerbating an existing condition.

2.10.23 Reductions in wellbeing associated with short-term, or very short-term, noise levels would be unlikely to persist beyond the period of elevated exposure. The general exposure profile would be one of low exposure to a small population.

SIGNIFICANCE OF EFFECT

2.10.24 As already outlined within Volume 6, Part 3, Chapter 9: Airborne Noise and Vibration describes how, following implementation of mitigation, residual impacts are assessed as not significant. Given VE would be a **low magnitude** of change, and the receptor sensitivity is at a **low to high sensitivity**, this represents a **minor adverse effect** in EIA terms.

2.10.25 The significance of the potential effects has been informed by the guide questions in Table 2.12.

2.10.26 The following discussion sets out the reasoned conclusions for the professional judgement reached:

- Scientific literature does show a causal link between chronic noise above certain thresholds and health determinants. The evidence does not indicate a lower threshold at which health effects do not occur;
- Baseline conditions do show that compared to national comparators the affected population has higher levels of deprivation in the populations around the onshore study area and Tendring when compared to the regional and national averages.
- Tendring and the four LSOAs assessed have a higher level of retirement age people in comparison to the regional and national average. This suggests that there is potential for more people to be at home during the day. However, the proportion of children (aged 0 to 15) is also relatively low in comparison to the regional and national average, whom are another group that are likely to spend greater periods of time at home;
- Although there are slight differences in the LSOA's, it is considered that these are not significant enough to result in a different impact. Therefore, all the Tendring LSOA's shall have the same level of impact;
- Whilst not an indicator of the populations potentially affected by noise from the VE, Annex 2.1 does identify that the rate of complaints about noise in Tendring is lower than Essex and England; and
- Volume 6, Part 3, Chapter 9: Airborne Noise and Vibration describes how, assuming mitigation is implemented, residual impacts are assessed as not significant.

2.10.27 The conclusion of the assessment for population health is that the significance of the effect would be negligible for the general population and minor adverse for hard-to-reach groups. Vulnerability in this case relates to, carers, young children, retirement aged population, those with long term illness, and those who are unemployed or shift workers who are most likely to spend more of their time at home and who are living adjacent to the Project. All effects would be short-term, temporary and would cease on completion of the works. Therefore, there would be no residual long-term health outcome.

IMPACT 2: AIR QUALITY

2.10.28 During construction, there is potential for air quality to be temporarily affected by dust and fine particulate from construction, and emissions from construction vehicles.

2.10.29 The population groups relevant to this assessment, due to either proximity or other sensitivity, are defined in Section. 0

2.10.30 The key health outcomes relevant to this determinant of health are an increased risk of cardiovascular diseases (Meo and Suraya, 2015) and asthma exacerbation (Orellano et al., 2017).

2.10.31 The temporal scope for this effect (as described in Paragraph 2.4.5) varies depending on the area of the Project:

- At landfall, there is a short-term temporal scope due to the use of trenchless techniques and the presence of landfall compound;

2.10.32 Along the onshore ECC there are a very short-term temporal scope because (as described in Volume 6, Part 3, Chapter 1: Onshore Project Description) the onshore cable route will be constructed sequentially. ECC works will include trenchless crossings of major obstacles, roads, railways, rivers and other ecological features, with the potential for 24 hours working. Further to this, the applicant has set out several mitigation measures within the Volume 9, Report 21: Code of Construction Practice that will be implemented throughout the full duration of the construction;

- At the OnSS (there is a medium-term temporal scope because the works are planned for a maximum design scenario of 24-months; and
- With regards to traffic emissions, there is a medium-term temporal scope because this will be a requirement for the entirety of VEs construction phase. However, locally, the impacts will be short term as the works move along the onshore cable route.

2.10.33 The conclusions Volume 6, Part 3, Chapter 10: Air Quality of this ES can be summarised as follows:

- Impacts due to construction dust and fine particulate are not significant with appropriate mitigation (additional mitigation not required); and
- Construction vehicle exhaust emissions are not significant (additional mitigation not required).

2.10.34 The mitigation measures taken into consideration during the assessment are as described in Volume 6, Part 3, Chapter 10: Air Quality.

SOURCE-PATHWAY-RECEPTOR

2.10.35 The potential effect is considered likely because (based on the methods described in Section 0) there is a plausible source-pathway-receptor relationship where:

- The source is construction plant and operations;
- The pathway is pressure waves through the air; and

2.10.36 Furthermore, the potential effect is probable as no unusual conditions are required for the source-pathway-receptor linkage.

SENSITIVITY OF RECEPTOR

2.10.37 The sensitivity of the general population is considered to be low and the sensitivity of vulnerable/hard to reach groups (collectively as a single group) is considered to be high based on the methods described in Section 2.5).

2.10.38 Vulnerability in this case is linked to:

- Living close to sources of poor air quality (populations near the landfall, ECC or OnSS)
- Age (both young people and older people);
- Existing poor health (e.g., Long-term illness);
- Spending more time in affected dwellings (e.g., Due to low economic activity, shift work; or ill health); or

2.10.39 Similar for noise, people who live near the infrastructure elements of the VE infrastructure and spend longer periods of time at home are more likely to be exposed to longer periods of air pollution as a result of the project, as opposed to those who are absent during the working day, and as such, the same baseline data provided for noise is also relevant to air quality.

2.10.40 As shown in Annex 2.1, data has also been collected relating to background air pollution concentrations (PM2.5). Tendring has an background air pollution concentration of 7.6 µg/m^3 which is 75% less than the UK air quality and similar to the national average which is 7.5 µg/m3. In addition, the percentage of mortality as a consequence of particulate air pollution is the same as the national average of (5.6%) and lower than that of Essex (5.8%). This data alludes to the consensus that air quality is not significant health determinant at the local level.

2.10.41 Below is the reasoning for the sensitivity level decided for the general population and vulnerable groups:

- The general population is considered to have a low sensitivity as overall, health indicators show a healthy population of working age, which skews towards an older population and there is a low population surrounding the onshore infrastructure elements of the project.
- As with noise, the sensitivity of vulnerable groups is considered to be high, as there is a higher proportion of households where nobody is in employment, of retirement aged people, and where people have long term illness. The deprivation of two of the LSOAs considered are also amongst the 20% most deprived areas in England. In addition, as indicated in Annex 2.2, there are 3 primary schools are one secondary within 500m of the red line boundary of VE who could be affected from air quality effects.

MAGNITUDE OF IMPACT

2.10.42 The magnitude of the change due to VE can be characterised as low (based on the methods described in Section 2.5). For air pollutants that are respirable (e.g., NO2, PM10 and PM2.5), the change in air quality close to particular dwellings or other community receptors would be infrequent and of short duration (being predominantly limited to periods of passing trench work or vehicle traffic). The changes would be below all recognised statutory thresholds for health protection. For particles of non-respirable size, coarser (larger and heavier) fractions of dust are expected to rapidly reduce in concentration with distance from source due to precipitation.

2.10.43 The potential for nuisance-type dust effects is therefore expected to be occasional and limited. For finer fractions of dust precipitation rates would be slower, affecting a wider area and thus more people. However, exposure is expected to be low due to the finer dust particles dispersing (reducing in concentration) with increased distance. At these levels it is unlikely that there would be changes in the risk of developing a new health condition or of exacerbating an existing condition. It is unlikely that there would be a significant change in population health outcomes for the neighbouring community during these periods.

2.10.44 The impact on health associated with air quality as a result of VE would only cause a negligible change in EIA terms to the quality of life for a small proportion of the population. Following the completion of the construction phase, air quality health impacts that have materialised as a result of VE would be reversed an as such the magnitude of VE is considered to be low.

SIGNIFICANCE OF EFFECT

2.10.45 As already outlined within Volume 6, Part 3, Chapter 10: Air Quality describes how, following implementation of mitigation, residual impacts are assessed as not significant. Given VE would be a **low magnitude** of change, and the receptor sensitivity is at a **low to high sensitivity**, this represents a **minor adverse effect** in EIA terms.

2.10.46 The significance of the potential effects has been informed by the guide questions in Table 2.12.

2.10.47 The following discussion sets out the reasoned conclusions for the professional judgement reached:

- Scientific literature does indicate a causal link between air pollution due to dust, particulate, and various gases, including those associated with internal combustion engines with health impacts. Whilst the literature supports there being thresholds set for health protection purposes, it also acknowledges that for some air pollutants there are non-threshold health effects (i.e., when there is no known exposure threshold level below which adverse health effects may not occur). The assessment has identified population groups that may be particularly sensitive to air quality effects. The assessment in Volume 6, Part 3, Chapter 10: Air Quality that the concentration of pollutants is not likely to exceeded thresholds set for health protection (i.e., UK AQOs);
- Baseline conditions show that there is a marginally higher proportion of people that are likely to be at home, i.e., closer to the construction area, for more of the day;
- These populations align with the Health Priority areas of Essex County Council who have a particular focus on enabling and supporting people with long term conditions and disabilities;
- Although there are slight differences in the LSOA's, it is considered that these are not significant enough to result in a different impact. Therefore, option one and two shall have the same level of impact;
- The air quality assessment is summarised above and indicates that with mitigation and control measures implemented the onshore construction works would be within statutory requirements (UK AQOs) and would be unlikely to result in nuisance from widespread dust deposition. The assessment undertaken in Volume 6, Part 3, Chapter 10: Air Quality follows regulatory guidance as required in the UK; and
- The NPS for Overarching Energy (EN-1) (Department of Energy and Climate Change, 2011c) does require projects to consider air pollution, which has been undertaken, but notes that projects with significantly detrimental impacts on health are subject to separate regulations which will constitute effective mitigation.

2.10.48 The conclusion of the assessment for population health is that the significance of the effect would be negligible in EIA terms for the general population and minor adverse for vulnerable groups. Vulnerability in this case relates to people living adjacent to the onshore ECC with existing poor respiratory health (such as asthma or chronic obstructive pulmonary disease), as well as carers, young children, retirement aged population, those with long term illness, and those who are unemployed or shift workers who are most likely to spend more of their time at home. All effects would be short-term, temporary and would cease on completion of the works. Therefore, there would be no residual long-term health outcome.

IMPACT 3: GROUND AND/ OR WATER CONTAMINATION

2.10.49 During construction, water quality has the potential to be temporarily affected by construction site run-off, or temporary impoundment of water courses. Drinking water is not likely to be affected because the population of Essex is supplied by piped drinking water and do not abstract water directly from surface or ground water sources without treatment.

2.10.50 The population groups relevant to this assessment, due to either proximity or other sensitivity, are defined in Section 0.

2.10.51 The key health outcomes relevant to this determinant of health relate to potential toxicological exposure associated with contaminated bathing water. Effects may relate to either biological toxins (e.g., associated with eutrophication) or chemical toxins (e.g., associated with mobilisation of historic contamination).

2.10.52 The temporal scope for these effects is short term because the most likely pathways are at points where the cable makes landfall, or where the onshore cable route crosses small scale watercourses.

2.10.53 The conclusions of Volume 6, Part 3, Chapter 5: Ground Conditions and Land use and Volume 6, Part 3, Chapter 6: Hydrology, Hydrogeology and Flood Risk can be summarised as follows:

- No significant adverse residual effects in terms of short-term risk to construction workers and offshore human receptors during the development of the ECC and associated infrastructure, including the OnSS.
- Minor adverse residual effects in terms of water quality, flood risk and contamination of resources.

2.10.54 The mitigation measures taken into consideration during the assessment are as described in of Volume 6, Part 3, Chapter 5: Ground Conditions and Land use, Volume 6, Part 3, Chapter 6: Hydrology, Hydrogeology and Flood Risk and Volume 9, Report 21: Code of Construction Practice.

SOURCE-PATHWAY-RECEPTOR

2.10.55 Based on the information provided within Table 2.7, there is a plausible but unlikely source-pathway-receptor relationship:

- Sources include the potential for accidental fuel spill, or mobilisation of historic contamination;
- The pathway would be contaminants in bathing waters; and
- Receptors include users of the beach at landfall and users of watercourses.

2.10.56 The plausibility of the potential effect occurring largely depends on unusual conditions to make the source-pathway-receptor linkage. The sources relate to accidental releases of pollutants or the unexpected encountering of historic contamination. Potential for water quality impacts from works around the landfall is negligible as any excavations is likely to only have potential to mobilise sands and any direct pollution from spills will be very small relative to the receiving environment.

2.10.57 Mitigation measures are described in of Volume 6, Part 3, Chapter 5: Ground Conditions and Land use, Volume 6, Part 3, Chapter 6: Hydrology, Hydrogeology and Flood Risk and Volume 9, Report 21: Code of Construction Practice, to reduce the probability of a risk occurring, and should it occur, further mitigation to reduce the risk of widespread contamination that could affect the public.

SENSITIVITY OF RECEPTOR

2.10.58 The sensitivity of both the general population and vulnerable groups is determined separately in accordance with the methods presented in Section 0. The sensitivity of the general population is considered to be low for the general population and medium for vulnerable groups. This reflects the limited likelihood that people would interact with bodies of water for recreational purposes.

2.10.59 Vulnerability in this case is particularly linked to:

- age (predominantly young people);
- Living close to sources ground or water contamination (populations near the landfall, ECC or OnSS); and
- existing poor health (e.g., long-term illness).

2.10.60 Vulnerability is most prevalent among children. The baseline presented in Annex 2.1 shows that all LSOAs considered have a lower percentage of the population who are children when compared to the local, regional and national average. The LSOA with the highest children population is at the landfall (Tendring 008G) at 15.4% which is higher than Tendring as a whole (15.8%), Essex (18.5%) and England (19%).

2.10.61 Annex 2.1 also shows that the site-specific locations have a lower population density than at the local regional level; the highest site-specific population density is at the landfall which has a population density of 184.1 (people per square kilometre) which is significantly lower than that of Tendring as a whole (440.0) and Essex (434.7). This is representative of the surrounding rural context of the VE's onshore infrastructure and as a consequence mean there is a low likelihood of people that would interact with bodies inland surface water for recreational purposes.

MAGNITUDE OF IMPACT

2.10.62 The magnitude of the change due to VE can be characterised as a low magnitude of change (based on the methods described in Section 2.5).

2.10.63 As discussed, Volume 6, Part 3, Chapter 5: Ground Conditions and Land use outlines residual impacts will be either minor adverse significant or minor adverse. The general public would not come in contact with and have access any impounded water. In addition, VE has also been subject to interactive site selection process, in part, to avoid areas that would be most sensitive to ground contamination. Volume 9, Report 21: Code of Construction Practice also sets out measures to prevent pollution and contamination of water resources. This includes ensuring that areas of risk of spillage will be bunded and carefully sited to minimise the risk of hazardous substances entering drainage systems or local watercourses.

2.10.64 Ground water contamination effects as a result of VE would also be localised, occur in the short-term and would be of a highly infrequent nature. The general exposure profile would also be one of low exposure to a small population.

SIGNIFICANCE OF EFFECT

2.10.65 As already outlined within Volume 6, Part 3, Chapter 5: Ground Conditions and Land use, Volume 6, Part 3, Chapter 6: Hydrology, Hydrogeology and Flood Risk describes how, following implementation of mitigation, residual impacts are assessed as not significant or are minor adverse.

2.10.66 Given VE would be of a **low magnitude of change**, and the receptor sensitivity is at **low sensitivity**, this represents a **minor adverse effect** in EIA terms.

2.10.67 The significance of the potential effects has been informed by the guide questions in Table 2.12.

2.10.68 The following discussion sets out the reasoned conclusions for the professional judgement reached:

- Scientific literature indicates sufficient strength of evidence from sufficiently high-quality scientific studies to establish that clean and sufficient drinking water is required to remain healthy. Children may be particularly sensitive to toxicological effects due to developmental stage and more time spent outdoors, including use of bathing waters. The baseline indicates that the areas affected by VE typically have a lower-than-average percentage of young people (compared to national comparators) and lower population density (compared to national comparators);
- Although there are slight differences in the LSOA's, it is considered that these are not significant enough to result in a different impact. Therefore, the Tendring LSOAs assessed are considered to have the same level of impact.
- The conclusion of the assessment for population health is that the significance of the effect would be negligible for the general population and negligible for hard-to-reach groups. Vulnerability in this case may particularly relate to disruption in the unlikely event of a serious contamination event that may require bathing waters to be temporally closed or temporary use of alternative emergency water sources. All effects would be short-term, temporary and would cease on completion of the works. Therefore, there would be no residual long-term health outcome.

IMPACT 4: PHYSICAL ACTIVITY

2.10.69 During construction, there is the potential for physical activity to be temporarily affected by VE due to the potential to temporarily divert Public Rights of Way (PRoWs), national cycle networks, bridleways, by ways and long distances walking routes. However, it should be noted that the design of VE has sought to avoid interaction with public open spaces like playing fields. In addition, Tendring DC's Proposals Map designate an area of land affected by the construction works as being 'safeguarded open space'. This area of land is discussed in the accompanying draft Statement of Reasons (Document Reference 4.3).

2.10.70 The potential impacts as a result of the construction of VE would be the severance of the land which reduces the amenity, the disruption of normal activities of the land, the impedance of access to the recreational usage of the land, restrictions to the usage of the land and temporary change in the land's current use.

2.10.71 The population groups relevant to this assessment, due to either proximity or other sensitivity, are defined in 0.

2.10.72 The key health outcomes relevant to this determinant of health are physical health conditions (e.g., cardiovascular health) and mental health conditions (e.g., stress, anxiety, or depression) associated with levels of physical activity and obesity levels. For example, due to the level of active travel (such as road cycling), leisure activities (such as team sports on public facilities) or outdoor activities (such as hiking or mountain biking).

2.10.73 The temporal scope for these effects is (as described in Paragraph 2.4.5) is short term. During these periods there would be a change in the tranquillity and perceived quality of physical activity opportunities.

2.10.74 The conclusions of Volume 6, Part 3, Chapter 3: Socioeconomics, Tourism, Recreation, Volume 6, Part 3, Chapter 5: Ground Conditions and Land Use, and Volume 6, Part 3, Chapter 8: Traffic and Transport are summarised below:

- There are several PRoWs located throughout the LAI, however, the residual effect on routes will be negligible; no PRoWs will be closed without the provision of an alternative route, as set out within Volume 9, Report 25: Outline Public Access Management Plan.
- Impacts on national cycle routes are minor (non-significant).
- The level of impact on the Tendring Hundred Hinterland routes has the potential to be moderate (adverse). However, it is noted that further inclusions to Volume 9, Report 25 Outline Public Access Management Plan (PAMP) would be used to ensure there are no significant effects.
- Effects on offshore recreational facilities are summarised as being minor adverse or negligible. It is assumed that any impact on Offshore Recreation would be part of the phased working programme and would therefore be localised and temporary in nature.
- Effects on community facilities are summarised as being minor adverse or negligible. It is also assumed that any impact on Offshore Recreation would be part of the phased working programme and would therefore be localised and temporary in nature.
- The designated ‘safeguarded open space’ will only have temporary disruption during construction. Although the site is designated as open space, it is not used by the public for recreation purposes.
- Regarding vulnerable road users and road safety, pedestrian amenity, and community severance, impacts to all these topics are considered to be negligible/adverse. Volume 9, Report 24: Outline Construction Traffic Management Plan also sets out measures to mitigate effects including the commitment to proving suitable signage to inform users of temporary road closures and the available diversions.

2.10.75 The mitigation measures taken into consideration during the assessment are as described in Volume 6, Part 3, Chapter 3: Socioeconomics, Tourism, Recreation, Volume 6, Part 3, Chapter 5: Ground Conditions and Land Use, Volume 6, Part 3, Chapter 8: Traffic and Transport, Volume 9, Report 24: Outline Construction Traffic Management Plan and to Volume 9, Report 25 Outline Public Access Management Plan (PAMP).

SOURCE-PATHWAY-RECEPTOR

2.10.76 The potential effect is considered likely for outdoor activities (based on the methods described in Section 2.5). This is because there is a plausible source-pathway-receptor relationship between VE and PRoWs (including recreational onshore and offshore amenities):

- The source is trenching activity and vehicles/plant operations increasing emissions and disturbance on the PRoWs (including recreational use of coastal waters/beaches);
- The pathway is gases and dust particulates travelling through the air reducing amenity; and
- Receptors are users of the PRoWs, resulting in a lower level of active travel or outdoor recreation.

2.10.77 Furthermore, the potential effect is probable as no usual conditions are required for the source-pathway-receptor linkage.

SENSITIVITY OF RECEPTOR

2.10.78 The sensitivity of both the general population and vulnerable groups is determined separately in accordance with the methods presented in Section 0. The sensitivity of the general population is considered to be low for the general population and high for vulnerable groups.

2.10.79 Vulnerability in this case is linked to:

- Living close to the onshore elements of VE (populations near the landfall, ECC or OnSS)
- People with existing poor health (physical and mental health)
- Children and young people
- Older people (particularly those suffering with dementia)

2.10.80 As already discussed, the assessed LSOA comprise a higher proportion of people aged 65+ and lower portion who are children (aged 0-15) when compared to the regional and national average. The area near the landfall (Tendring 008G) comprises the highest percentage of people aged 65+ and area near the ECC corridor (Tendring 003E) comprises the lowest number of people aged 0-15 out of all the populations considered (site specific-national). The number of working adults (aged 16-64) at each of the LSOAs, apart from Tendring 005C (area near the substation) is lower than the regional and national average.

2.10.81 It has also been noted that there is a poor quality of health within Tendring when compared to the regional and national average based on a self-assessment of health, however, the assessed LSOAs, are slightly above the average as Tendring as a whole. In context of vulnerability resulting from a loss of physical activity opportunities, the ageing population and population with poor quality of health, may be particularly affected, as such populations may be reliant on use of recreational amenities for health benefits to reduce the onset of health problems associated with age. Older people may also be more reliant on public transport modes to access physical activity opportunities which may be impacted by the project, however, as disused, the Construction Traffic Management Plan (CTMP) (Volume 9, Report 24) will be implemented to prevent significant effects.

2.10.82 Further to this, the baseline data presented with the Annexes shows that deprivations is particularly high within the LSOAs of which are all with the 40% most deprived LSOAs nationally. This infers these areas may be vulnerable to loss physical activity opportunities as they are less likely to have the capacity seek use of alternative recreational amenities.

2.10.83 However, the baseline data presented in the Annexes also illustrates that all the LSOAs have a significantly lower percentage of households who don't have any access to cars/vans. The area at the Landfall (Tendring 008G) comprises the largest population (11.9%) who have no car/van access (per household), which is lower than Tendring as a whole (20.1%), Essex (15.9%) and England (23.5%). As consequence of the site-specific locations having greater access to a vehicle, there would be greater opportunities for them to access wider physical activity opportunities. Although, it should be noted that this may be due to the rural context of the LSOAs and as such, vehicle ownership may influence people away from exercise.

2.10.84 Annex 2.1 also shows that the number of physically active adults in Tendring (61.0%) is lower than the regional (65.7%) and national (65.9%) average. This is also the case for physically active young people and children (35.0%) when compared to the regional (43.5%) and national (44.6%). This data indicates that the site-specific locations assessed would be vulnerable to a loss recreational amenity, given the number of physical active people in Tendring is lower than regional and national average and thus further loss of such amenities may deter people participating in physical activity.

2.10.85 Furthermore, as outlined in Annex 2.1, obesity levels for adults aged 18+ are higher in Tendring (67.8% of the population) compared to Essex (64.0%) and England (63.5%). This is also the case for younger children; for example, 35.0% of year 6 pupils in Tendring are classified as being overweight, which is slightly higher than Essex (32.1%) and England (34.6%). As a consequence, these groups may be reliant on the existing physical activity opportunities and may find it difficult to seek alternatives.

2.10.86 People with disabilities would also be sensitive to loss of physical activity opportunities. The assessed LSOAs and Tendring as a whole encompasses a greater percentage of people who are disabled under the quality act than the regional (16.7%) and national average (17.3%). Tendring as a whole attains the highest percentage of people disabled under the equality act (24.1%), with the area near the landfall (Tendring 008G) comprising the largest percent (23.3%) out of the LSOAs assessed.

2.10.87 Below is the reasoning for the for-sensitivity level decided for the general population and vulnerable groups:

- The general population is considered to have a low sensitivity as overall, health indicators are slightly lower than the regional to national average, and at the site-specific to local levels, a greater number of households have access to vehicles which will allow alternative physical activity opportunities to be utilised.
- The sensitivity of vulnerable groups is considered to be high, as there is a high proportion of people who would be unable to adapt to changes and who have limited access to alternatives (e.g., walking routes with a tranquil setting). This includes the site-specific ageing population, people who are classified as obese and populations who suffer from deprivation. These groups may undertake less

exercise during the period that they are affected by active VE project works and therefore forgo the benefits to physical and mental health.

MAGNITUDE OF IMPACT

2.10.88 The magnitude of the change due to VE can be summarised as low (based on the methods described in Section 2.5). The reduction in the quality of the environment would be temporary and reversible. Temporary diversions may marginally increase the length of a ProW, which may decrease use by some people. However, the temporary diversions would be unlikely to affect population physical activity levels to the extent of changes in the risk of developing new health conditions or of exacerbating existing conditions. Any short-term changes in physical activity levels would be unlikely to have a lasting influence on population health and are also reversible.

SIGNIFICANCE OF EFFECT

2.10.89 As already outlined within Volume 6, Part 3, Chapter 3: Socioeconomics, Tourism, Recreation, Volume 6, Part 3, Chapter 5: Ground Conditions and Land Use, Volume 6, Part 3, Chapter 8: Traffic and Transport describes how, following implementation of mitigation, residual impacts are assessed as **not significant**. Given VE would be a **low magnitude of change**, and the receptor sensitivity is at a **low to medium sensitivity**, this represents a **minor adverse effect** in EIA terms.

2.10.90 The significance of the potential effects has been informed by the guide questions in Table 2.12.

2.10.91 The following discussion sets out the reasoned conclusions for the professional judgement reached:

- Scientific evidence draws a strong link between levels of physical activity and physical and mental health outcomes. The evidence also indicates that nearly half of people aged over 60-years may be inactive;
- In the Tendring LSOAs assessed, there are a higher number of people aged 65+ n comparison to the Essex average and national average
- People considering their health to very good or good across all the LSOAs assessed is lower than the Essex and National average, however, higher than the average of Tendring as a whole;
- All representative neighbourhoods show a higher level of childhood and adult obesity than the average for Essex and England;
- Although there are slight differences in the LSOA's, it is considered that these are not significant enough to result in a different impact. Therefore, option one and two shall have the same level of impact.
- Essex County Council identified addressing obesity, improving diet, and increasing physical activity as a key area of focus. includes obesity reduction, improvements in mental health and creating a healthier physical environment as key health priorities.

2.10.92 The conclusion of the assessment for population health is that any changes in health outcomes associated with disruption of, or reduced environmental quality (noise, dust, air quality and views) along, PRoWs would be minor adverse for the general population and **minor/moderate adverse for vulnerable groups** in EIA terms.

2.10.93 There would be no residual long-term health outcome, with the impacts localised and only occurring during the construction period.

IMPACT 5: JOURNEY TIMES AND / OR REDUCED ACCESS

2.10.94 During construction, there is the potential for journey times and access to be temporarily affected by an increase in the number of heavy goods vehicles or employee vehicles on the road and temporary traffic management at certain locations. These have the potential to lead to temporary delays and temporarily reduce access to local services.

2.10.95 This includes accessing health care which can affect emergency response times or non-emergency treatment outcomes associated with delays or non-attendance caused by increased traffic and journey times arising from additional traffic from VE. As such vulnerability can be considered most prevalent for people living in deprived areas within close proximity to the onshore VE infrastructure, particularly people with long-term illnesses and carers, as well as users of ambulance services.

2.10.96 Highway improvement works are proposed (see Section 7.0 of Volume 6, Part 3, Annex 8.1: Traffic and Transport Baseline Report) to facilitate safe two-way HGV movements for the section of Bentley Road between and including the junction with the A120 and the VE construction accesses and may also include a segregated WCH path, the requirement for which would be discussed and agreed with Essex County Council and informed by surveys of the use of Bentley Road by pedestrians, cyclists and horse-riders.

2.10.97 The widening of Bentley Road would minimise any potential mounting of verges by HGVs and Part 9, Report 24: Outline CTMP that has been prepared to be submitted alongside the ES for the DCO application sets out the range of measures that could be implemented to manage and monitor VE construction traffic.

2.10.98 The temporal scope for these effects is (as described in Paragraph 2.4.5) variable:

2.10.99 With regards delays due to traffic management along routes:

- At landfall, there is a short-term temporal scope due to use of trenchless techniques and presence of a temporary onshore works area;
- Along the onshore ECC there is a very short-term temporal scope because (as described in Volume 6, Part 3, Chapter 1 Onshore Project Description) the cable route will be constructed sequentially;
- Temporary road closure is planned at Bentley Road; and
- At the OnSS, there is a short-term temporal scope because the works are planned across a maximum design scenario of 24-months.

2.10.100 With regards to traffic movement, the temporal scope would also be short term.

2.10.101 Volume 6, Part 3, Chapter 8: Traffic and Transport concludes the majority of the highway links, the temporary adverse effects on driver severance and delay would cause minor adverse impacts, which is not significant in terms of the EIA Regulations.

- Implementation of mitigation, as outlined in Volume 6, Part 3, Chapter 8: Traffic and Transport, will reduce the magnitude of impacts to low, resulting in the temporary adverse effect on driver severance and delay reducing to minor adverse impacts, which is not significant in terms of the EIA Regulations. Mitigation includes:

- Volume 9, Report 26: Outline CTMP that sets out the key principles and types of measures to be implemented during construction of the project; and
- Volume 9, Report 26: Outline WTP which includes a range of demand management measures including a target car share ratio. The Outline WTP also provides details of how compliance with targets will be measured, monitored and reported upon.

SOURCE-PATHWAY-RECEPTOR

2.10.102 The potential effect is considered likely because (based on the methods described in Section 0) this is a potential source-pathway-impact relationship as follows:

- The source relates to an increased number of vehicles on the road network or temporary traffic management measures due to VE;
- The pathway is journey times or accessibility to amenities/services, particularly healthcare (emergency and non-emergency); and
- The receptor is local road and footpath users.

2.10.103 Furthermore, the potential effect is probable as no unusual conditions are required for the source-pathway-receptor linkage.

SENSITIVITY OF RECEPTOR

2.10.104 The sensitivity of both the general population and vulnerable groups is determined separately in accordance with the methods presented in Section 0. The sensitivity of the general population is considered to be medium for the general population and high for vulnerable groups. Vulnerability is this case is linked to:

- The population of Tendring and the four assessed LSOAs (site-specific and local);
- People living in deprivation, including those on low incomes; and
- People with existing poor health (physical and mental health).

2.10.105 The baseline statistics presented in Annex 2.1 show that journey times to access eight key services via car and public transport within Tendring are comparable to averages for Essex and England, however, are longer via walking and cycling. The baseline data also indicates a greater number of people in Tendring and the four LSOAs drive a car or van to work; using Tendring as a whole as an example, 57.6% of the drive a car or van to work, compared to Essex and England which accounts for 48.2% and 44.5% of the population respectively.

2.10.106 When considering the average distances travelled to work, the baseline data is representative of the rural nature of the VE project area. To give an example, people who have to travel less than 2km to get to work across all the LSOAs is lower than the Tendring as a whole (4.7%), Essex (9.8%) and England (11.0%) average. The area near the substation (Tendring 005C) has the fewest perchance of people who live within 2km of their workplace (2.9%). However, the highest percentage.

2.10.107 Below is the reasoning for the for-sensitivity level decided for the general population and vulnerable groups.

2.10.108 As already discussed, Tendring and the LSOAs assessed attain higher levels of deprivation when compared to the regional and national average; Tendring is ranked in the top 30 most deprived authorities (out of 317) and all the LSOAs are within the top 40% most deprived areas, with Tendring 003E and Tendring 007B in the top 20%. As a consequence, these site-specific and local population(s) already face more access barriers than the general population and therefore be more sensitive to access changes. The more sensitive population particularly includes those accessing health services (emergency or non-emergency) at times and locations where there may be some increase in congestion. Ambulance services (and the recipients of their care) are particularly sensitive to delays. Further to this, Tendring and the four LSOAs assessed is made up an ageing population with a higher number of people with existing illnesses when compared to the regional and national average; this population is more likely to require medical assistance and urgent care

2.10.109 Below is the reasoning for the for-sensitivity level decided for the general population and vulnerable groups:

- The general population of the general population is considered have a medium sensitivity because journey times to work are similar to the average in England and the population is considered to be in generally worse health than the rest of England health hence requiring more visits to primary health care.
- The sensitivity of vulnerable groups is considered to be high, as the is a high proportion of site-specific groups who are more likely to require urgent medical care and/or require frequent use of the local road networks for medical purposes. This is coupled with the reason that car/van transport being the predominant mode of transport within the site-specific areas (which is expected given its rural context) and as such would be directly by diversions or road closures.

MAGNITUDE OF IMPACT

2.10.110 The magnitude of the change due to VE can be characterised as low as follows (based on the methods described in Section 2.5). These reasons are listed below:

- Only small changes in journey times would be expected, largely relating to short delays at key junctions;
- The frequency of any delays is likely to be low because works are sequential, and delays would be temporary. Any change is considered unlikely to be of a scale that would affect quality of life or receipt of time-critical healthcare;
- Any change in journey times would be reversible as VE does not make any permanent change to the road network;
- Although a large number of people may be affected, the change experienced by people is expected to be small. The general exposure profile would be one of low exposure to a large population;
- Residual effects are of a negligible or minor adverse significance as outlined within Volume 6, Part 3, Chapter 8: Traffic and Transport. Several mitigation measures are also proposed, including Outline CTMP (Volume 9, Report 24);
- Across Tendring as a whole and the four LSOAs, there is a higher proportion of the population at retirement age when compared to Essex and England who are likely to require urgent and or frequent medical assistance.

SIGNIFICANCE OF EFFECT

2.10.111 As already outlined Volume 6, Part 3, Chapter 8: Traffic and Transport, the chapter describes how, following implementation of mitigation, residual impacts are assessed as not significant. Given VE would be a **low magnitude of change**, and the receptor sensitivity is at a **medium to high sensitivity**, this represents a **minor adverse effect** in EIA terms.

2.10.112 The significance of the potential effects has been informed by the guide questions in Table 2.12.

2.10.113 The following discussion sets out the reasoned conclusions for the professional judgement reached:

- Scientific literature shows an association between access and healthcare outcomes. The evidence base shows a correlation between areas with greater access to primary health care and lower hospitalisation rates for ambulatory care sensitive conditions (conditions which are potentially avoidable by well-functioning primary care) (Rosano et al., 2013);
- Transportation barriers to health care access are common, and greater for vulnerable populations. Patients with a lower socio-economic status have higher rates of transportation barriers to ongoing health care access than those with a higher socio-economic status. Transportation barriers can also affect access to pharmacies and thus medication adherence (Syed et al., 2013);
- Baseline conditions show that some communities in the vicinity of the onshore VE area may have a lower socio-economic status and therefore face higher rates of transportation barriers. Generally, there is less car ownership when compared with England;
- Although transportation is not a specific health priority of Essex County Council, it underpins other health priorities supporting people with long-term health conditions and disabilities;
- Although there are slight differences in the LSOA's, it is considered that these are not significant enough to result in a different impact. Therefore, the Tendring LSOAs assessed are considered to have the same level of impact; and
- The NPS for Overarching Energy (EN-1) (Department of Energy and Climate Change, 2023) advises whether a need to determine if the change in population would increase demand on local services.

2.10.114 The conclusion of the assessment for population health is that the significance of the effect would be minor adverse for the general population and minor adverse for vulnerable groups in EIA terms. Vulnerability in this case relates to people living in deprived areas in the vicinity of the landfall, onshore cable route, and onshore substation, particularly people with long-term illnesses (and their carers) and users of ambulance services. The effects are considered occur over a short-duration and are reversible following the completion of construction phase.

2.10.115 Any impacts would be temporary during construction and the Applicant would work with anyone affected to ensure any closures are communicated. In addition, there is the potential to coordinate traffic movements to endeavour to minimise cumulative impacts wherever possible. With mitigation measures adopted such as measures within Volume 9, Report 24: Outline CTMP no significant impacts are predicted.

2.11 CONSTRUCTION AND OPERATIONS MAINTENANCE

IMPACT 6: EMPLOYMENT

2.11.1 Employment has been considered across both construction and operation because, as discussed in Volume 6, Part 3, Chapter 3: Socio-Economic, Tourism and Recreation, the development of VE is part of a wider process of developing an offshore wind supply chain in the region. Therefore, from a human health point of view, creating a demand for transferable skills (both between construction projects and on to operation of projects) has a multiplying effect on employment. Direct employment by VE also creates indirect employment in the supply chain and induced employment due to expenditure.

2.11.2 The key health outcomes relevant to this determinant of health are indirect influences on physical health (e.g., cardiovascular conditions) and mental health conditions (e.g., stress, anxiety, or depression) due to improvements in social determinants, such as improved socio-economic position, greater job security and facilitating beneficial lifestyle choices (e.g., healthier eating and recreational physical activity, including for dependents).

2.11.3 The temporal scope for these effects is (as described in Paragraph 2.4.5) is variable:

- During construction the temporal effect is measured in years, but individuals may only be directly employed for months at a time. However, the overall effect on direct and indirect employment would be considered across the duration of the construction phase and is therefore medium term; and
- During operation it is expected that people would be permanently employed and that this employment could last for decades. Therefore, the temporal scope is long term.

2.11.4 The conclusions of Volume 6, Part 3, Chapter 3: Socio-Economic, Tourism and Recreation concludes that VE will have significant, beneficial effects on the economy during the development and construction. The assessment has identified positive effects on the economy of the LEA, the Regional Area, and the UK during both the O&M and decommissioning phases.

2.11.5 The applicant has also produced an Outline Skills and Employment Strategy (Volume 9, Report 27) which will further enhance employment opportunities as a result of the project.

SOURCE-PATHWAY-RECEPTOR

2.11.6 The potential effect is considered likely because (based on the methods described in 0) there is a potential source-pathway-impact relationship:

- The source is direct and indirect job creation due to the development of the Project;
- The pathway is through employment, with increased probability of effect due to supply chain and skills development being undertaken by the Project; and
- The receptor is people of working age in the regional labour market (and their dependents).

2.11.7 Furthermore, the potential effect is probable as no unusual conditions are required for the source-pathway-receptor linkage.

SENSITIVITY OF RECEPTOR

2.11.8 The sensitivity of both the general population and vulnerable groups is determined separately in accordance with the methods presented in Section 2.5. The sensitivity of the general population is considered to be medium for the general population and high for vulnerable groups.

2.11.9 Vulnerability in this case is linked to:

- The population of Tendring District (local);
- The population of Essex County (regional);
- People subject to deprivation (such as geographic vulnerability and those experiencing income vulnerability)

2.11.10 Sensitivity in this case is related to how likely it is a population could benefit from being employed. When considering baseline data presented in the Annexes Tendring has a Gross Weekly Pay (inclusive of full-time and part-time), of approximately £561.90, which is significantly lower than the average for Essex (£664.80) and England (£629.90). This consequently alludes to a poor quality of income and indicates that the population will benefit from new employment opportunities.

2.11.11 In addition, when considering the deprivation IMD domain rankings, employment in Tendring is considered to be the 22nd most deprived (within top 7% of most deprived) (out of 317 local authorities) which further indicates the local population would benefit from employment opportunities. Employment deprivation is better however among the LSOAs; the area near the ECC faces the worse level employment deprivation, ranking 6,370 out of 32,844 (within top 20% most deprived).

2.11.12 Education/qualifications is also an important consideration to sensitivity, as on one hand, those with no qualifications may benefit from increased employment and the associated Outline Skills and Employment Strategy (Volume 9, Report 27) that will be submitted as part of the DCO. However, populations who have a lower level of qualifications, may find it difficult to gain employment in the technical areas required by the offshore wind industry. The baseline data collected shows that those within no qualifications in Tendring (26.2%), is at a higher percentage than the regional (18.9%) and national (18.1%) average. The deprivation score also indicates a poor level of education attainment; education deprivation in Tendring is ranked as the 12th most deprived out of 317 local authorities (top 4%).

2.11.13 Below is the reasoning for the for-sensitivity level decided for the general population and vulnerable groups:

- The general population of the general population is considered have a medium sensitivity. This is because the regional population also has below average income deprivation compared to national comparators. As shown in the baseline (Annex 2.1 and 2.2) education deprivation is relatively low compared to the rest of England. People with a lower educational attainment may find it harder to gain employment in technical areas required by the offshore wind industry;
- The sensitivity of vulnerable groups is considered to be high, as some populations may rely on employment opportunities generated from VE and the associated work experience and qualifications.

MAGNITUDE OF IMPACT

2.11.14 The magnitude of the change due to VE can be characterised based on the methods described in Section 2.5) as negligible (minor beneficial). There would be direct and indirect employment opportunities both during construction and during operation. Construction jobs would be short- to medium-term but include upskilling that would have longer term benefits. Operational jobs could provide many years of benefit to those employed and their dependants. The majority of the jobs are expected to be drawn from the regional level, providing benefits to those employed as well as their dependents. Compared to national comparators, the higher proportion of retired people (and lower proportion of young people) close to the actual project sites suggests that fewer direct economic benefits would be experienced in these areas. The Project's smaller contribution to direct employment (as a proportion of the regional labour market) suggests the change, is positive, however is unlikely to be associated with a significant widespread reduction in inequalities or a widespread increase in prosperity or quality of life. The magnitude (from the health perspective) is considered positive but low, driven by the longer-term regional benefits to upskilling and employment, which will be enhanced by the Outline Skills and Employment (Volume 9, Report 27) which will be secured as part of the DCO.

SIGNIFICANCE OF EFFECT

2.11.15 As already outlined within Volume 6, Part 3, Chapter 3: Socio-Economic, Tourism and Recreation, VE has the potential to have positive effects on employment opportunities. Given VE would be a **negligible** change in EIA terms, and the receptor sensitivity is at **a medium to high sensitivity**, this represents a **low beneficial significance of effect** in EIA terms.

2.11.16 The significance of the potential effects has been informed by the guide questions in Table 2.12.

2.11.17 The following discussion sets out the reasoned conclusions for the professional judgement reached:

- Scientific literature shows that good quality employment is generally associated with better health. Employment can have a protective effect on depression and general mental health (van der Noordt *et al*., 2014). Unemployment may occur due to poor health, it may also cause poor health (Herbig *et al*., 2013);
- There are more deprived areas close to landfall, onshore ECC, and OnSS that may struggle to benefit from employment opportunities;
- There are no regulatory standards with regards employment as a determinant of health; and
- The NPS for Overarching Energy (EN-1) (Department of Energy and Climate Change, 2023a) recommends:

"To consider the potential effects, including benefits, of a proposal for a project, the applicant must set out information on the likely significant environmental, social and economic effects of the development, and show how any likely significant negative effects would be avoided, reduced, mitigated or compensated for, following the mitigation hierarchy. This information could include matters such as employment, equality, biodiversity net gain, community cohesion, health and well-being."

2.11.18 The conclusion of the assessment for population health is that the significance of the effect would be negligible for the general population and minor beneficial for hard to reach groups. Vulnerability in this case relates to direct and indirect employment opportunities for people living in deprivation or who are of working age (including their dependents). Although there are slight differences in the LSOA's, it is considered that these are not significant enough to result in a different impact. Therefore, option one and two shall have the same level of impact.

2.12 OPERATION AND MAINTENANCE

IMPACT 7: NOISE

2.12.1 The potential for noise impacts during operation of VE's onshore substation has been considered in Volume 6, Part 3, Chapter 9: Airborne Noise and Vibration.

2.12.2 The population groups relevant to this assessment, due to either proximity or other sensitivity, are defined in Section 0.

2.12.3 The key health comes are the same as those discussed in Section 2.10 in relation to potential noise effects during construction.

2.12.4 The temporal scope for this effect is (as described in Paragraph 2.4.5) long term as it relates to the operational phase of the Project.

2.12.5 Volume 6, Part 3, Chapter 9: Airborne Noise and Vibration considers the operational noise associated with OnSS. It is considered that the mitigation measures recommended would be sufficient to reduce the noise from the OnSS so a negligible magnitude of impact would be experienced upon all the high sensitivity receptors considered, resulting in a level of effect of a permanent minor adverse which is considered not significant in terms of the EIA Regulations.

SOURCE-PATHWAY-RECEPTOR

2.12.6 The potential effect is considered likely for operational noise (based on the methods described in Section 0). This is because there is a plausible source-pathway-receptor relationship where:

- Source the operation of the onshore substation;
- Pathway noise transmission through the air; and
- Receptors communities of people local to the onshore substation.
- The potential effect is probable (however this is low) as no unusual conditions are required for the source-pathway-receptor linkage.

SENSITIVITY OF RECEPTOR

2.12.7 The sensitivity of the general population and vulnerable groups are the same as those discussed in Section 2.10, in relation to potential noise effects during construction at the onshore substation zone.

MAGNITUDE OF IMPACT

2.12.8 The magnitude of the change due to VE can be characterised as low (based on the methods described in Section 2.5. Volume 6, Part 3, Chapter 9: Airborne Noise and Vibration concludes that there will be no significant adverse residual effects following the implementation of mitigation. This includes localised screening and noise barriers.

2.12.9 Whilst the temporal scope of operational is long-term, effects would be highly localised as the onshore substation would only be experienced by the populations within close proximity and as such only a small population would be exposed to these effects.

SIGNIFICANCE OF EFFECT

2.12.10 As within the assessment of construction noise in Section 2.10, effects will be **of minor adverse significance** in EIA terms. Carers, young children, retirement aged population, those with long term illness, and those who are unemployed or shift workers who are most likely to spend more of their time at home and who are living near to the onshore substation, when compared to the working population who are absent during working day.

2.12.11 Any changes resulting from operational noise would only impact as small proportion of the populations nearing the substation. Despite being adverse effects, this will only pose a **minor effect** on addressing health inequalities, in line with the priorities of Essex County Council.

2.12.12 Although there are slight differences in the LSOA's, it is considered that these are **not significant** in EIA terms.

IMPACT 8: WIDER SOCIETAL BENEFITS

2.12.13 As a consequence of the operation of VE, there is the potential for wider societal gains, due to either proximity or other sensitivity as defined in Section 0.

2.12.14 VE would make a substantial contribution towards the delivery of renewable energy in line with the need to significantly decarbonise the power sector by 2030.

2.12.15 The new wind farm would include up to 79 wind turbine generators, across two separate seabed areas in the southern North Sea and create enough energy each year to power hundreds of thousands of homes. VE will create job opportunities, support the UK Government's ambitions for up to 50GW of electricity generated from offshore wind by 2030 and help meet the objectives of the UK Energy Security Strategy.

2.12.16 The key health outcomes relevant to this determinant of health are reducing premature deaths, heart attacks, asthma exacerbations, and hospitalisations for cardiovascular or respiratory issues (Harvard Chan School, 2022).

2.12.17 Volume 6, Part 4, Chapter 1: Climate Change, concludes that VE will be of a beneficial significance in terms of proving renewable energy and reducing the need for fossil fuels and the consequent production of GHG emissions.

SOURCE-PATHWAY-RECEPTOR

2.12.18 The potential effect is considered likely for operational noise (based on the methods described in Section 0). This is because there is a plausible source-pathway-receptor relationship where:

- Source renewable energy created during the operation of VE;
- Pathway (national) energy security, potential to contribute to affordable energy and reduction in air pollutant and GHG emissions; and
- Receptor all population groups listed in the following section.

SENSITIVITY OF RECEPTOR

2.12.19 The sensitivity of both the general population and vulnerable groups is determined separately in accordance with the methods presented in Section 0. The sensitivity of the general population is considered to be medium the general population and high for vulnerable groups.

2.12.20 Vulnerability in this case is linked to:

- The site-specific, local, regional, national and international populations;
- People with existing poor health (physical and mental health);
- Age (children, young people and older people); and
- People subject to deprivation (such as geographic vulnerability and those experiencing income vulnerability).

2.12.21 The baseline data presented in Annex 2.1 illustrates that fuel poverty is higher in Tendring (16.5%) than that of Essex and England at 13.2%). It has also been discussed in this assessment that there are higher levels of deprivation at the site-specific and local levels compared to the regional and national average. This further indicates that these populations face greater difficultly in keeping their homes adequately heated etc. In addition, Tendring as a whole, has a Gross Weekly Pay (inclusive of full-time and part-time), that is significantly lower than the average at the regional and national levels.

2.12.22 Renewable energy generation is also now dominating the electricity generation landscape, and in terms of offshore wind NPS EN-1 has an ambition to deliver 40GW of offshore wind by 2030. This equates to the installation of 2,666 of the larger turbines currently available at a rate of 333 turbines per year (Department of Energy and Climate Change, 2023a). This movement is supported by the government legal educe the UK's GHG emissions by at 78% (from 1990 levels). As such projects like VE will make a substantial contribution in realising this target whilst having wider societal benefits.

2.12.23 Below is the reasoning for the for sensitivity level decided for the general population and vulnerable groups:

- The general population is considered to have medium sensitivity as overall, VE will make a substantial contribution to the delivery of renewable energy which will provision more affordable energy, as well as resulting in positive health impacts due to less pollution emitted from the use of fossil fuels.
- The sensitivity of vulnerable groups is considered to be high sensitivity as the local population attain higher levels of fuel poverty and the site-specific populations face greater levels deprivation when compared to the regional and national averages. The site-specific and local populations also comprise an ageing population, with Tendring as a whole facing income vulnerability. As such, these populations will benefit from the provision of affordable energy, to support the transition away from fuel poverty and relieve financial burdens.

MAGNITDUE OF IMPACT

2.12.24 The magnitude of the change due to VE can be characterised as low to medium (based on the methods described in Section 2.5). This is because VE will increase national energy security which will result in positive health impacts by lessening the level of pollution emitted into the atmosphere from fossil fuels which are experienced on the international level. In addition, VE will help alleviate low to medium income groups out of fuel poverty through the provision of affordable energy. This proclamation is outlined within Volume 6, Part 4, Chapter 1: Climate Change, which confirms that VE will assist the UK in reducing GHG emissions and the trajectory to net zero by 2050. The chapter also states that VE will be of a beneficial significance.

SIGNIFICANCE OF EFFECT

2.12.25 As already outlined within Volume 6, Part 4, Chapter 1: Climate Change, VE will have a beneficial effect in reducing GHG emissions and delivering affordable energy.

2.12.26 Given the VE would be a **low to medium magnitude of change**, and the receptor sensitivity is at a **medium to high sensitivity**, this represents a **moderate beneficial effect** in EIA terms.

2.12.27 The significance of the potential effects has been informed by the guide questions in Table 2.12.

2.12.28 The following discussion sets out the reasoned conclusions for the professional judgement reached:

- Scientific literature shows that decarbonising the energy sector and switching to renewable energy helps to reduce air pollution and GHG emissions, which are associated with premature deaths, heart attacks, asthma exacerbation and hospitalisation for cardiovascular or respiratory issue;
- Tendring has a percentage of people in fuel poverty compared to the regional and national average, who would benefit from the provision of affordable energy;
- VE is likely to have marginal positive effects on alleviating people out of fuel poverty and reducing health inequalities; and
- The NPS for Overarching Energy (EN-1) (Department of Energy and Climate Change, 2023) emphasises that access to energy is beneficial to society and our health as a whole.

2.13 DECOMISSIONING

2.13.1 This section describes the potential impacts of the decommissioning of the onshore infrastructure with regards to effects on Human Health. Further details on decommissioning are provided in Volume 6, Part 2, Chapter 1: Offshore Project Description and Volume 6, Part 3, Chapter 1: Onshore Project Description.

2.13.2 No decision has been made regarding the final decommissioning plan for the Project, as it is recognised that industry best practice, rules and legislation change over time. The detailed activities and methodology would be determined later within VEs lifetime.

2.13.3 Whilst details regarding the decommissioning of the OnSS are currently unknown, considering the worst-case scenario which would be the removal and reinstatement of the current land use at the site, it is anticipated that the effects would be similar to or less than those during construction.

2.13.4 The decommissioning methodology would need to be finalised nearer to the end of the lifetime of VE so as to be in line with current guidance, policy, and legislation at that point. Any such methodology would be agreed with the relevant authorities and statutory consultees.

2.14 ENVRIONMENT ASSESSMENT: CUMULATIVE EFFECTS

2.14.1 This cumulative impact assessment for health has been undertaken in accordance with the methodology provided in Volume 6, Part 1, Annex 3.1: Cumulative Effects Assessment Methodology. The health determinants and health considered in this report include a number of inter-relationships. The following sections consider these relationships, taking account of the projects outlined within Volume 6, Part 1, Annex 3.1: Cumulative Effects Assessment Methodology.

2.14.2 By its nature, Health interacts with each of the other onshore topics assessed in this ES, due to its direct involvement as a receptor for other impacts, and it is therefore important to avoid duplication of the assessment of effects. Of particular note regarding the potential for inter-related and cumulative, are the following ES Chapters:

- Volume 6, Part 3, Chapter 3: Socioeconomics, Tourism and Recreation;
- Volume 6, Part 3, Chapter 5: Ground Conditions and Land Use;
- Volume 6, Part 3, Chapter 6: Hydrology, Hydrogeology and Flood Risk;
- Volume 6, Part 3, Chapter 8: Traffic and Transport;
- Volume 6, Part 3, Chapter 9: Airborne Noise and Vibration; and
- Volume 6, Part 3, Chapter 10: Air Quality.

2.14.3 The projects and plans selected as relevant to the assessment of impacts to health are based upon an initial screening exercise undertaken on a long list. Each project, plan or activity has been considered and scoped in or out on the basis of effect–receptor pathway, data confidence and the temporal and spatial scales involved. For the purposes of assessing the impact of the VE on health in the region, the cumulative effect assessment technical note submitted through the EIA Evidence Plan and forming Technical Annex 1.3.1 of this ES screened in a number of projects and plans as presented in Table 2.16.

Table 2.16: Description of Tiers of other developments considered for CEA

Tiers	Development Stage
Tier 1	Projects under construction.
	Permitted applications, whether under the Planning Act 2008 or other regimes, but not yet implemented.
	Submitted applications, whether under the Planning Act 2008 or other regimes, but not yet determined.
Tier 2	Projects on the Planning Inspectorate's Programme of Projects where a Scoping Report has been submitted.
	Projects under the Planning Act 2008 where a PEIR has been submitted for consultation.

Tier 3	Projects on the Planning Inspectorate's Programme of Projects where a Scoping Report has not been submitted.
	Identified in the relevant Development Plan (and emerging Development Plans with appropriate weight being given as they move closer to adoption) recognising that much information on any relevant proposals will be limited.
	Identified in other plans and programmes (as appropriate) which set the framework for future development consents/ approvals, where such development is reasonably likely to come forward.

2.14.4 All the cumulative projects that have been included in the cumulative assessment in each of the technical chapters have been taken into consideration within the cumulative effects assessment section of this chapter. This is with the exception of potential cumulative effects that have been determined insignificant when compared to the same health criterion considered within this HIA.

2.14.5 Smaller developments (such as small housing developments, minor applications etc.) have also not been considered in this HIA. This is because such developments are expected to be localised and temporary in nature, with the construction period spanning over a short duration. As such these developments are not considered likely to cumulatively affect any of the receptors that have been considered in this HIA.

2.14.6 It should be noted that the CEA has been informed on the information publicly available for each individual project, and following the completion of this assessment, additional schemes may come forward.

2.14.7 The screening of cumulative developments has been informed by the CEA VE list (see Volume 6, Part 1, Chapter 3, Annex 3.1: Cumulative Effects Assessment Methodology.) The list has been appraised based on the relevance of each project to the VE. Only cumulative effects that have been identified within the relevant technical chapters have been screened into the CEA for health.

2.14.8 Out of the respective technical chapters that are listed in Section 2.5, none of the cumulative effect assessments identified any significant cumulative effects. Concerning effects the local populations (including site-specific locations), no impacts that are at a greater significance than that as a result of VE, and no significant cumulative effects for health are anticipated.

Table 2.17: Projects considered within the cumulative effect assessment.

Development type	Project	Status	Data confidence assessment/ phase	Tier	Distance from Order Limits (KM)
Offshore Wind Farm	North Falls Offshore Wind Farm	Pre-application stage. The application is expected to be submitted to the Planning	High – Sourced from PINS	Tier 2	0

Development type	Project	Status	Data confidence assessment/ phase	Tier	Distance from Order Limits (KM)
		Inspectorate in 2024			
New high voltage network reinforcement between Norwich, Bromford and Tilbury	Norwich to Tilbury	Pre-application	High – Sourced from PINS	Tier 2	0
Nuclear Power Station	Sizewell C	Approved	High – Sourced from PINS	Tier 1	33.9
Solar Farm	Longfield Solar Farm	Approved	High – Sourced from PINS	Tier 1	34.3
Battery Energy Storage	Battery energy storage scheme (BESS) on land adjacent to Lawford Grid Substation,	Approved	High – Sourced from Tendring District Council		0.5

2.14.9 VE will include a landfall, onshore cable corridor(s) and onshore substation, with the locations of these design elements shown in Table 2:5. These design elements will be situated jointly with the North Falls Offshore Wind Farm cable corridor.

2.14.10 In accordance with the provisions of NPS EN-5 to seek to develop co-ordination solutions for onshore grid connections, VE has been working with North Falls on a co-ordinated solution to reduce the overall environmental and community impacts of the proposals. The project includes almost fully overlapping or combined Onshore ECCs and a co-located site for the OnSS to the west of Little Bromley. It is proposed the two projects' ducts will be installed adjacent to each other within the corridor. The level of co-ordination between the two projects has led to a higher degree of understanding and interactions with the North Falls proposals that can be used within the CEA than would be normal for other developments at a similar stage in the planning process.

2.14.11 Due to the independent timescales for each project, three delivery scenarios have been developed (details of each scenario can be found within Volume 3, Chapter 1: Onshore Project Description). For the purposes of the cumulative assessment of VE and North Falls, the worst case delivery scenario, with limited co-ordination has been assessed for the direct and indirect impacts.

2.14.12 In order for VE to connect to the National Grid, the proposed National Grid Norwich to Tilbury Reinforcement Project and the associated EACN substation must be operational. National Grid has defined a construction and operational zone within which their EACN substation will be situated. This is adjacent to the VE OnSS zone.

2.14.13 Despite its stage in the planning process, due to VE's reliance on this project for its connection to the National Grid, it has been given detailed consideration and treated with more certainty than other projects at similar stage in the planning process in the CEA. To assist with the assessment, it has been necessary to make assumptions as to the siting, scale, form and construction of the project, particularly the EACN substation. These assumptions have been checked and agreed to be appropriate and reasonable by National Grid. For the purposes of the cumulative assessment of VE and National Grid Norwich to Tilbury Project, the worst case delivery scenario, with limited co-ordination has been assessed for the direct and indirect impacts.

2.14.14 The Sizewell C nuclear power station was granted development consent on the 20th July 2022. Whilst this project is located approximately 33.9km from VE, construction may potentially take up to 12 years and as such overlaps with the temporal scope of the VE in terms of socio-economic impacts.

2.14.15 The BESS battery storage is located in Essex and sits adjacent to the Lawford substation. The project was granted permission in July 2022 and involves the construction and operation of a 50 MW BESS, and related infrastructure with associated access, landscaping, and drainage. Whilst the construction timeframe of this project is unknown, the project is located within 0.5km of the VE OnSS and as such overlaps spatially.

2.14.16 Regarding the Longfield Solar Farm, while there will be no spatial or temporal (during construction) overlap with VE, there may be cumulative operational effects on regional populations (i.e. employment).

2.14.17 Table 2:18 summarises the relevant cumulative health effects of each of the populations group. However, to summarize, no significant cumulative health effects have been identified.

Table 2.18: Inter-project cumulative effects for the populations considered within this Assessment.

Population group (LSOA)	Cumulative effects considered
Landfall (Tendring 008G)	At the landfall, there is the potential for a temporal and spatial overlap with the North falls due to the onshore infrastructure elements being situated in the same locations, as well as the anticipated potential for construction to take place in parallel. However, following a review of the CEA within the technical chapters listed in Section 2.1, no significant cumulative impacts are

Population group (LSOA)	Cumulative effects considered
	expected to materialise. It is also noted that the two projects have agreed to adopt a co-ordinated approach and will work together to minimise any anticipated impacts (including health). Operational impacts have not been considered as the assessment in the chapters listed in Section 2.1 anticipate that there will be no impact.
Export Cable Corridor (Tendring 003E and Tendring 007B)	Along the ECC, there is the potential for a temporal and spatial overlap with the North falls due to the onshore infrastructure elements being situated in within the same or very similar order limits, as well as construction being anticipated potential for construction to take place in parallel. However, following a review of the CEA within the technical chapters listed in Section 2.1, no significant cumulative impacts are expected to materialise. The coordinated approach with North Falls has facilitated impacts along the ECC to be minimised. This is because, the collaborative approach would reduce duplication of temporary infrastructure. Furthermore, the Order Limits have been kept to a width that allows for maximum flexibility when working with North Falls.
Onshore Substation (Tendring 005C)	Along the ECC, there is the potential for a temporal and spatial overlap with the North falls due to the onshore infrastructure elements being situated in adjacent locations, as well as anticipated potential for construction to take place in parallel. Overlap with the following developments is also likely as they are located in close proximity to the OnSS and may overlap temporally: > Norwich to Tilbury and associated EACN substation; and > Lawford BESS. Highway improvement works are proposed (see Section 7 of Volume 6, Part 3, Chapter 8: Traffic and Transport) to facilitate safe two-way HGV movements for the section of Bentley Road between and including the junction of the A120 and the VE construction accesses and may also include a segregated non - motorised user (NMU) path, the requirement for which would be discussed and agreed with Essex County Council and informed by surveys of the use of Bentley Road by pedestrians, cyclists and horse-riders. The widening of Bentley Road would minimise any potential mounting of verges by HGVs and Part 9, Report 24: Outline CTMP that has been prepared to be submitted alongside the ES for the DCO application which sets out the range of measures that could be implemented to manage and monitor VE construction traffic.

Population group (LSOA)	Cumulative effects considered
	A cumulative assessment has been undertaken based on some estimated traffic flows associated with a number of consented developments and consented and proposed NSIPs, including North Falls and the National Grid works, including the EACN Substation. Any impacts would be temporary during construction and the Applicant would work with anyone affected to ensure any closures are communicated. In addition, there is the potential to coordinate traffic movements to endeavour to minimise cumulative impacts wherever possible. With mitigation measures adopted such as measures within Volume 9, Report 24: Outline CTMP no significant impacts are predicted.
Tendring (Local level)	All the projects considered within this Chapter as well as those within the CEA long list (see Volume 6, Part 1, Annex 3.1: Cumulative Effects Assessment Methodology) that have the potential to overlap with VE both spatially and temporally, are set to be distributed throughout the area. As such, it is expected that there will be no significant cumulative effects. Further to this, taking into account the projects coming forward at the local level, there is the potential for cumulative positive health effects related to employment, as a consequence of various projects generating combined, increased employment opportunities. In addition, VE have developed an Outline Skills and Employment Strategy (Volume 9, Report 27) submitted as part of the DCO and will develop this further throughout the phases of the project. The applicant has worked in collaboration with North Falls to carry out joint engagement with stakeholders to feed into the respective Outline Skills and Employment Strategies. The initiatives from such plans will cumulatively support the upskilling and training of the local population, making new employment opportunities more accessible. As identified in this HIA, this will be beneficial due to the levels of deprivation and low levels of education/qualifications at the local level.
Essex (regional level)	All projects considered within this Chapter as well as those within the CEA long list (see Volume 6, Part 1, Annex 3.1: Cumulative Effects Assessment Methodology) that have the potential to overlap with VE both spatially and temporally, are distributed across the area. As such, it is expected that there will be no significant cumulative effects. Similar to the local level, there will be cumulative positive effects in terms of employment, and such opportunities will support in offsetting the downturn in employment in the offshore oil industry.
England (National Level)	The cumulative effects of the nationally significant infrastructure projects coming forward regionally (such as VE and North Falls)

Population group (LSOA)	Cumulative effects considered
	are considered to have beneficial cumulative effects. As outlined in Volume 6, Part 4, Chapter 1: Climate Change, such projects are beneficial nationally (and internationally) as they will support the government's objective of reaching net zero as well as contributing to the provision of affordable energy supplies which is particularly important for vulnerable groups who are on local incomes or face deprivation. Moreover, the benefits of renewable infrastructure like VE would increase national security of energy and would result in health benefits due to the reduction of GHG emitted into the atmosphere.

2.14.18 Regarding the potential cumulative effects for vulnerable groups assessed within this HIA, Table 2:19 provides a summary of the different determinants relevant to heath.

Table 2.19: Heath determinants relevant to vulnerable population groups

Vulnerable Group	Relevant impacts
Children and young people	> Construction and operational noise; > Construction air quality; > Physical activities affected from construction; > Construction and operational employment; and > Operational wider societal benefits.
Older people	> Construction and operational noise; > Construction air quality; > Physical activities affected from construction; > Construction and operational employment; and > Operational wider societal benefits.
People classified as having poor physical and or mental health	> Construction and operational noise; > Construction air quality; > Physical activities affected from construction; > Construction and operational employment; > Operational wider societal benefits;

Vulnerable Group	Relevant impacts
	> Construction journey times and reduced access.
People subject to deprivation (including income vulnerability	> Construction and operational employment; > Construction journey times and reduced access; and > Operational wider societal benefits.

2.14.19 For both children, young people, older people and people with poor heath, it is not anticipated that there will be a combined biophysical determinant to health. This is because the effects of the different projects are localised, temporary and include a spatial and temporary separation, with all projects distributed across different areas.

2.14.20 In terms of people subject to deprivation, it is not anticipated that the projects assessed would cumulatively exceed local route capacities without the provision of alternative routes or diversions. Moreover, there is the potential for positive cumulative effects due to increase employment opportunities and associated training programmes which can contribute to alleviating groups out of deprivation.

2.14.21 To summarise, no significant cumulative health impacts are anticipated and there is the potential for positive impacts when VE is taken into account with other relevant development projects. This includes positive health effects at the site-specific and local levels through the creation of new employment opportunities that can help alleviate deprivation levels. There are also wider-societal benefits at a regional-national level for supporting the government's transition to net zero and consequent reduction in GHGs and provision of affordable energy supplies.

2.15 MAJOR DISASTERS AND CLIMATE CHANGE

OVERVIEW AND IMPACTS SCOPED OUT

2.15.1 As already discussed, the conclusion of the scoping opinion considered that there was not a sufficient amount of information to conclude that there would be no LSE from potential major accidents and disasters in respect to the vulnerability of VE to these impacts or for VE to cause them.

2.15.2 For context however, a major accident, as defined in the Control of Major Accident Hazards (COMAH) Regulations 2015 (as amended), means "an occurrence such as a major emission, fire, or explosion resulting from uncontrolled developments in the course of the operation of any establishment to which these Regulations apply, and leading to serious danger to human health or the environment (whether immediate or delayed) inside or outside the establishment, and involving one or more dangerous substances".

2.15.3 A determination of significance is required for compliance with the EIA regulations 2017 when a potential effect of the Project is likely (or relates to the Project's vulnerability to major accidents or disasters). The risk of 'major accidents and/or disasters' occurring associated with any aspect of VE, during the construction, operation and decommissioning phases are anticipated to be negligible, following guidance published by IEMA on Major Accidents and Disasters in EIA (IEMA, 2020). Instead, a Code of Construction Practice (Volume 9: Report 21) has been provided as part of the DCO application.

2.15.4 As will be discussed and outlined in this section, the potential for major disasters is negligible and such matters have been considered within each specific topic chapter in the ES and therefore are not assessed within this Chapter.

2.15.5 It should also be noted that the handling and storage (or control) of large quantities of chemicals or substances hazardous to health has been scoped out as VE will not require large quantities of hazardous substances and therefore will not be impacted by major disasters. Smaller quantities of hazardous substances such as paint and fuel will be stored in locked and/or bunded containment as appropriate.

IMPACTS SCOPED IN

2.15.6 The main areas of vulnerability for the development stem from its marine operating conditions (but for which it will be designed in the first place), coastal erosion at the landfall and flood risk. However, the likelihood of a natural disaster for any of these components leading to consequential significant environmental effects is negligible.

2.15.7 Vulnerability to major disasters that could affect VE are related the aspects listed below, which predominantly stem from the projects marine operating conditions:

- Risks to aviation;
- Risks to shipping and navigation;
- Flood risk;
- Costal erosion at the landfall; and
- And future climate change scenarios/projections that could increase vulnerability.

2.15.8 As will be discussed, the likelihood of any of the above consequential significant environmental effects is negligible and therefore, it is not necessary to assess their potential impacts within this Chapter. This is because, these matters have been covered across the ES and where required, mitigation has been proposed which has contributed to the conclusion that the effects are negligible. The overreaching chapters which cover aspects listed above are:

- Volume 6, Part 2, Chapter 9 Shipping and Navigation;
- Volume 6, Part 2, Chapter 13: Military and Aviation;
- Volume 6, Part 3, Chapter 3: Socioeconomic, Tourism and Recreation
- Volume 6, Part 3, Chapter 6, Hydrology, Hydrogeology and Flood Risk.

2.15.9 Furthermore, as detailed within Volume 6, Part 4, Chapter 1: Climate Change, future projections of climate change have been considered both within the chapter itself and the other technical chapters across the ES. This is based on Met Office data have been considered within the ES as a way to assess the projects resilience to climate change. Such information has been used to identify potential impacts, which have been ameliorated through the project design across the planning stages that form part of the DCO process.

SUMMARY OF POTENTIAL MAJOR DISASTERS AND ACCIDENTS

2.15.10 Below provides a summary of the major disasters considered across the ES, with references to where further information is provided. The overall conclusion is that after the relevant mitigation measures are applied, VE would not cause any significant residual effects in relation to major disasters.

2.15.11 This is because typically, Offshore wind developments have an intrinsically low risk of causing major accidents. The wind turbines, blades, towers and foundation bases of offshore windfarms have an excellent safety record with a very low failure rate and are positioned many kilometres offshore away from populated areas and the public. On the rare occasion that offshore turbine blades have been lost into the sea or damage has been caused to a turbine by a fire within the nacelle, this has resulted without injury.

2.15.12 Moreover, the performance of each turbine is constantly monitored through the SCADA system sending performance data through to a central, partly automated monitoring and control centre. As a result, a problem can be quickly detected and pre-prepared safety management action plans rapidly enacted.

2.15.13 In addition, it should be noted that the iterative site selection process (as detailed within Volume 6, Part 1, Site Selection and Alternatives) has ensured that VE has been located away from the most sensitive areas to major disasters.

2.15.14 For full details of mitigation measures that the Project has committed to is outlined by ES Topic within Volume 9, Document 31: Schedule of Mitigation – Routemap which is submitted with this DCO.

Table 2.20: Summary of Major Disasters with an overview of the mitigation.

Topic	Major Disaster	Overview of mitigation that makes the potential disasters negligible
Aviation	The construction of VE will create a physical obstruction to flight operations in the vicinity of the array areas. Construction infrastructure such as vessels, offshore substation platforms and erected wind turbines can be difficult to see from the air, particularly in poor meteorological conditions, leading to potential increased obstacle collision risk. Furthermore, during the construction phase, the presence and movement of construction infrastructure may present a potential obstacle collision risk to low flying aircraft operations.	The potential for the major disaster is negligible. This is as a consequence of the mitigation measures set out within Volume 6, Part 2, Chapter 13: Military and Civil Aviation, which includes: > The preparation of an Emergency Response Co-operation Plan, which will be secured as part of the Deemed Marine Licence (dML) that would detail specific marking and lighting of the wind turbines and facilitate liaison and procedures between the wind developer and HM coastguard in the event an emergency response is required; > Notification to aviation stakeholders regarding the details of the wind turbine including construction and decommissioning dates, locations and heights; and The use of fitment of aviation obstruction lighting. The above measures comply with current guidelines and be agreed with the appropriate stakeholders
Shipping and Navigation	There is the potential for several risks associated with shipping and navigation, which include: > Vessel displacement and increased collision risk (array areas and offshore ECC); > Third-party with project vessel collision risk (array areas and offshore ECC); > Reduced access to local ports and harbours and reduction in under keel clearance (array areas and offshore ECC); > Creation of allision risk (array areas); > Anchor interaction with subsea cables (array areas and offshore ECC); and > Reduction of emergency response capability (including Search and Rescue access) (array areas and offshore ECC).	Whilst exposed power cables on the sea bed can pose a snagging risk to shipping and fishing vessels, the project's export and array cables will be buried where possible to protect the cables and remove the snagging risk that the increased vessel movement to and from the site may pose to navigational safety during construction and operational phases. All the risks associated with shipping and navigation will be mitigated by proposed measures which have been informed by Volume 9, Report 9.10: Navigational Risk Assessment. As a consequence, the risk of a major disaster occurring is negligible. The mitigation measures are set out within Volume 6, Part 2, Volume 9: Shipping and Navigation and include: > A detailed CBRA to enable informed judgements regarding burial depth to optimise the chance of cables remaining buried whilst seeking to limit the amount of sediment disturbance to that which is necessary. An outline CBRA is provided within Volume 9, Report 9. > Development of, and adherence to, a Cable Specification and Installation Plan (CSIP), relating to the offshore ECC, post consent. The CSIP will set out appropriate cable burial depth in accordance with industry good practice, minimising the risk of cable exposure. The CSIP will also ensure that cable crossings are appropriately designed to mitigate environmental effects, these crossings will be agreed with relevant parties in advance of CSIP submission. The CSIP will be conditioned in the deemed Marine Licence. An Outline CSIP has been provided as part of this DCO Application (Volume 9, Report 12). > A Navigation and Installation Plan (Volume 9, Report 20) will be developed to manage interactions between project vessels associated with export cable installation/

Topic	Major Disaster	Overview of mitigation that makes the potential disasters negligible
		maintenance/ repair and third-party vessels in navigationally sensitive areas. The outline NIP is provided in Volume Report 20: Outline Navigation and Installation Plan. With the above mitigation and those outlined within Volume 6, Part 2, Volume 9: Shipping and Navigation, there will be no significant effects arising from VE, whether in isolation or cumulatively with other projects, during the construction, operation & maintenance, and decommissioning phases.
Flood Risk and Coastal erosion	There is the potential for several risks associated flooding and coastal erosion including: > Changes to surface water runoff patterns which could increase flood risk; > Pollution incidents; > Damage of flood defences and surface water drainage infrastructure; and > Generation of turbid runoff that could enter the water environment.	Flood risk and coastal erosion is considered within the following chapters: > Volume 6, Part 3, Chapter 6: Hydrology, Hydrogeology and Flood Risk; > Volume 5, Report 3.2: Flood Risk Assessment- Onshore Substation; and > Volume 5, Report 3.1: Flood Risk Assessment- Cable Route. The main risks associated with hydrology, hydrogeology and flood risk are associated with water flooding caused by un-named watercourses/drains and the increased impermeable area at sites near the project's infrastructure elements. To mitigate any potential effects, examples are provided below or proposed mitigation which mean the potential for a major disaster is negligible: > The CoCP (Volume 9, Document 21) includes measures to control the impacts of watercourse crossing, crossing beneath flood defences and flood readiness at construction sites identified within the Flood Risk Assessments; > Areas at risk of spillage, such as vehicle maintenance areas and hazardous substance stores (including fuel, oils, and chemicals) will be bunded and carefully sited to minimise the risk of hazardous substances entering drainage systems or local watercourses; and > Where required and practical, drainage would be installed either side of the onshore ECC to ensure existing land drainage flow regimes are maintained.
Climate Change Trends	Future climate change projections and scenarios have the potential to exacerbate the potential of the other major disasters discussed in this table. To give an example, Climate change is predicted to result in warmer and wetter winters and hotter and drier summers but also with increased occurrence of extreme weather events and a general increase in sea water levels.	Projections of future climate change are provided within Volume 6, Part 4, Chapter 1: Climate Change and are considered across the whole ES, with the potential for a major disaster to occur as a result of VE negligible.
Hospital Visits and GP access	There is the potential for Majors disasters arising from VE to place increased pressure/demands on hospitals/healthcare services like GPs. In addition, the influx of construction workers may temporarily exert extra pressure on demands for healthcare services in very limited and urgent circumstances.	GP capacity within the local impact area and hospitals within the order limits of VE are outlined within Volume 6, Part 4, Chapter 2, Annex 2.1: Human Health Baseline. Whilst there are only two hospitals within the order limits that contain an accident and emergency (A&E) department (Colchester and Ipswich Hospital), no significant adverse impacts have been identified with respect to hospital capacity/demands. This is a result of the mitigation proposed throughout the ES chapters which has considered the risk of 'major accidents and/or disasters' occurring associated with any aspect of the project, during the construction, operation and decommissioning phases as negligible. In addition, with a commitment to the highest health and safety standards in design and working practises enacted, none of the anticipated construction works or operational procedures is expected to pose an appreciable risk of major accidents or disasters and therefore hospital visits associated with major accidents or disasters would be negligible in EIA terms. Specific measures to alleviate major health disasters are discussed in the following row of this table within the review of 'other health matters'.

Topic	Major Disaster	Overview of mitigation that makes the potential disasters negligible
		Regarding increasing pressures/demands on public health services as a result of an influx in construction workers, Volume 6, Part 3, Chapter 3: Socioeconomics, Tourism and Recreation concludes that access to primary healthcare facilities would be minor adverse and not significant. This is because construction workers would be residing locally to the Project area on a temporary basis and living within tourist/visitor accommodation during on-shift periods and would return home during off-shift periods and weekends. These workers are unlikely to be on long-term contracts given the technical nature of work packages and contract and would therefore not be expected to live in the area for long periods, bring their families, or change their home-based approach to primary healthcare access including prescribing and GP access
Other health matters	Other Risks to human health associated with the infrastructure elements of the Project.	<u>Buried cables</u> The buried cables onshore and offshore pose very little risk to the public as the system is designed to detect faults and 'trip out' the circuits automatically should any failure in insulation along the cable be detected. <u>Substation fires</u> The risk of substation fires is historically low however substation fires can impact. the supply of electricity and create a localised fire hazard. The highest appropriate levels of fire protection and resilience will be specified for the onshore substation and National Grid substation to minimise fire risks. The onshore substation is located sufficiently distant from populated areas to further minimise the risk of fire hazard. <u>Dangerous lubricants/fuel</u> The lubricants, fuel and cleaning equipment required within the project will be stored in suitable facilities designed to the relevant regulations and policy design guidance. <u>Fatalities during construction</u> VE proposes safety zones which are temporary exclusion areas enacted during construction and major maintenance, allowing VE and its contractors to control vessel movement to enable safe construction works to proceed. Onshore, controlled, or closed construction sites will be operated where construction works are undertaken in sections where access is strictly controlled during periods when the works are ongoing. VE recognises the importance of the highest performance levels of health and safety to be incorporated into the project. There is a commitment to adhere to a high level of process safety, from design to operations and for all staff, contractors, and suppliers to have a high level of safety awareness and knowledge of safety and safe behaviour. VE will enact a Code of Conduct for suppliers, contractors, and subcontractors. They must all comply with the Code as well as health and safety legislation. VE will also ensure that employees that are going to work for them have undergone necessary health and safety training, with a commitment to the highest health and safety standards in design and working practises enacted.

2.16 CONCLUSIONS

2.16.1 The main drivers of potential human health effect are the construction process and the associated construction traffic. These activities may lead to increased noise levels, dust, and emissions. However, a combination of the mitigation (described in this Chapter) and additional mitigation (detailed in the relevant technical chapters) can be used to control these impacts to an acceptable level (not significant in EIA terms).

2.16.2 Human health effects due to changes in noise, air quality, ground or water contamination, physical activity, reduced access to health services, employment and the perception of risk have been assessed. This assessment finds that for the general population there would be no significant (in EIA terms) effect on human health as a result of VE.

2.16.3 After consideration of potential health effects during the construction and operation phases of VE, it is concluded that there will be no significant effects on physical or mental health as a result of VE. The results of the human health assessment are summarised Table 2.21.

2.16.4 Whilst not specifically assessed within this Chapter due to having negligible effects, consideration has been given to major disasters. This includes risks related to shipping and navigation, military and aviation, flood risk and coastal erosion and future climate change scenarios that may exacerbate flood risk for example via warmer temperatures and increased frequency of extreme events.

2.17 INTER-RELATIONSHIPS

2.17.1 The effects of the individual health determinants that have been assessed within this Chapter, have the potential to be experienced by the same populations and as a consequence result in additive or synergistic effects.

2.17.2 This assessment has considered geographical populations as well as those defined as other sensitive and as a consequence vulnerable to differing impacts.

2.17.3 A small number of individuals may have multiple vulnerabilities like poor health and age which is categorized as intersectionality and consequently experience greater changes to health outcomes. However, they are not expected to be widespread in relation to their overlap with VEs activities to result in likely significant impacts at the population level.

2.18 TRANSBOUNDARY EFFECTS

2.18.1 There are no transboundary effects with regard to human health as the VE onshore area is within the UK and is not located near any international boundaries.

2.18.2 Transboundary effects have therefore been scoped out of the assessment and are not considered further.

2.19 SUMMARY OF EFFECTS

2.19.1 In summary, after consideration of potential health effects during the construction and operation phases of VE, it is concluded that there will be no significant effects on physical or mental health as a result of VE. The results of the human health assessment are summarised

Table 2.21 Summary of health effects

Potential effect	Temporal scope	Probability of effect	Sensitivity of general population	Sensitivity of vulnerable population	Magnitude of effect	Significance of effect on general population	Significance of effect on vulnerable population
Construction							
Noise	Mainly Short Term	Plausible	Low	High	Low	Negligible	Minor Adverse
Air Quality	Mainly Short Term	Plausible	Low	High	Low	Negligible	Minor Adverse
Ground/Water Contamination	Short Term	Plausible But Improbable	Low	Medium	Low	Negligible	Negligible
Physical Activity	Short Term	Likely	Low	High	Low	Negligible	Minor Adverse
Journey Times/Reduced Access	Short Term	Likely	Medium	High	Low	Minor Adverse	Minor Adverse
Construction And Operation							
Employment	Long Term	Likely	Medium	High	Medium	Minor Beneficial	Moderate Beneficial
Construction And Maintenance							
Noise	Long Term	Low Probability	Low	High	Low	Negligible	Minor Adverse
Wider Societal Benefits	Long Term	Likely	Medium	High	Low To Medium	Minor Beneficial	Minor Beneficial
Decommissioning							
The possible health effects arising from the decommissioning of VE are considered to be similar in scale and nature to those considered here for construction.							

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